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The Economic Record

Vol. XXXIV August, 1958 No. 68

THE AUSTRALIAN ECONOMY, JULY 1958

1. *Recent Trends*

A short while ago a paper on the Australian economic situation would have opened with a discussion about the factors affecting the inflationary situation or perhaps an explanation of how any redressment of the balance of payment deficit would add to the inflationary pressure. In these circumstances statistics of unemployment were a secondary consideration. Today we are no longer in this position and while unemployment statistics do not tell the whole story they are the first piece of information to be studied. Over the past two years the balance of weight on the economic see-saw has slowly shifted. From an inflationary situation the economy moved for some months to a delicate balance and although economic policy has been designed to maintain this position there are signs that the see-saw has continued past the horizontal position and is beginning to dip gently in the opposite direction.

Several factors have contributed to this situation. As the full impact of the supplementary budget of March 1956 was gradually felt by the economy, demand slowly decreased to a level that could be accommodated by the supply of goods and services available under the tightened import conditions. But even so it was by no means certain that this situation would continue. Wool prices rose steadily throughout the 1956/7 season. The increase in export receipts together with the reduction in import payments produced a balance of payments surplus and a substantial rise in our international reserves.

The rise in wool incomes might well have led to increased expenditure. Indeed a slight strengthening of the labour market took place around the middle of 1957[1] while industrial production expanded after the steady contraction of the previous twelve months. The stage seemed set for expansion. An expansion which might well have been met by a relaxation of import restrictions. Everything depended upon the price of wool in the 1957/8 season.

The answer was not long coming. Wool prices sagged at the opening sales and continued to fall throughout the season. Neither the expected revival of inflationary pressure nor the hoped for relief from import restrictions materialized. The balance of payments steadily weakened. Nevertheless industrial production steadied and the level of employment continued to grow. At the same time industrial capacity expanded while unemployment became more prevalent.

1. See H. W. Arndt, "The Australian Economy", *Economic Record*, December 1957, p. 302.

2. *Employment*

The position with regard to employment and unemployment is shown in Table I. The number of persons registered for employment with the Commonwealth Employment Service during the first half of 1958 was considerably in excess of the number registered in the same period in 1957. In a similar manner the number of vacancies registered

TABLE I

Employment

Date	Persons Seeking Employment	Registered Vacancies	Excess of Persons Seeking Employment Over Vacancies	Number on Unemployment Benefit	Civilian Employment
	'000	'000	'000	'000	'000
1957					
January	52·6	30·1	22·5	15·7	2,853
February	49·5	24·3	25·2	13·1	2,871
March	46·5	21·7	24·8	13·1	2,875
April	46·1	20·7	25·4	15·5	2,862
May	51·1	19·8	31·3	15·3	2,867
June	52·2	18·4	33·8	18·1	2,865
July	53·1	18·8	34·3	20·3	2,860
August	51·3	20·8	30·5	20·2	2,857
September	48·7	22·1	26·6	19·0	2,863
October	47·1	25·1	22·0	17·9	2,867
November	51·6	25·3	26·3	19·8	2,873
December	58·9	24·5	34·4	26·0	2,871
1958					
January	74·8	25·9	48·8	29·9	2,874
February	70·0	20·7	49·3	26·9	2,885
March	64·4	19·2	45·2	24·5	2,892
April	67·4	18·0	49·4	27·7	2,889
May	66·0	17·4	48·6	27·3	2,889
June	67·1	15·9	51·2	29·4	2,887
July	65·9	16·5	49·4	29·9	—

Sources: Commonwealth Statistician, *Monthly Bulletin of Employment Statistics.*
Dept. of Labour and National Service, *Monthly Review of Employment Situation.*

during the first half of 1958 was well below the number registered in the same period in 1957. As one measure of the extent of unemployment it is worthwhile looking at the difference between these two series. The excess of persons seeking employment over registered vacancies shows a strong rising trend of unemployment in 1958, particularly when each month is compared with the corresponding month of the preceding year. The same movement is present in the number of persons receiving unemployment benefit.[2]

2. If the reader is interested to graph these series the underlying trend can be clearly seen against the seasonal movement. Unfortunately the seasonal pattern of the last two years is sufficiently different from that during the near zero unemployment era to make it exceedingly difficult to construct a satisfactory deseasonalized series.

Against this picture of steadily increasing unemployment can be seen a slow but consistent expansion of employment. During the twelve months ended June 1958 civilian employment increased by 21,200 persons. Manufacturing absorbed 50 per cent of this increase while Commerce took about 35 per cent. The increase in Commerce was almost entirely in Retail Trade. Employment in Building and Construction and transport fell sharply over the year as a whole but picked up during the last four months. After showing a strong increase up to March 1958 employment in Manufacturing steadied and then showed a slight drop. This was largely seasonal and the next few months should show increases in manufacturing employment—at least up to Christmas 1958.

TABLE II

Changes in Civilian Employment (a)

Industrial Group	June 1957 to June 1958	Feb. 1958 to June 1958
	'000	'000
Mining and quarrying	−4·8	−1·5
Manufacturing	+10·2	−3·7
Building and construction	−4·8	+3·4
Transport	−3·1	+2·6
Communication	+1·7	−0·5
Property and finance	+3·9	+0·3
Commerce	+7·6	−2·2
Health	+3·1	+1·3
Education	+4·2	+1·7
Other	+3·2	−0·6
	+21·2	+0·8

(a) Excluding wage earners in rural industries and private domestic service.

Source: Commonwealth Statistician, *Employment Statistics.*

Exactly what the overall rate of unemployment is at present is difficult to say. The excess of persons seeking employment over registered vacancies as a percentage of the wage and salary earners in civilian employment is one convenient estimate. This calculation yields an unemployment rate of 1·8 per cent. However, during the same period that civilian employment increased by 21,200 or 0·7 per cent, the proportion of persons seeking employment to civilian employment rose by 0·5 per cent. Unfortunately these percentages do not account for the increase of approximately 2 per cent which should have taken place in the work force from migration and natural increase.[3] Accordingly the figure of 1·8 per cent is probably a slight under-estimate of the state of unemployment.

The real fear, however, arises not from the absolute level of unemployment but from the fact that the upward trend of unemploy-

3. The failure of the official statistics on employment and unemployment to add up to the increase in the work force leads to the obvious conclusion that errors probably exist in the statistics of civilian employment or unemployment or both.

ment shows no sign of abatement and if ignored could have important repercussions on our economic future. In an economy which has been geared to development any serious set back to investment could impair the rate of progress for a considerable period of time.

3. *Price Stability and the Economic Tempo*

There has been a great deal of discussion in the post-war period regarding the difficulty of achieving price stability while maintaining a policy of full employment. It seems to have been generally accepted that if full employment is defined as a situation where the number of people seeking employment is exactly equal to the number of jobs

TABLE III

Prices and Wages

(Percentage change on preceding quarter)

Period	Retail Prices (a)	Wholesale Prices (b)	Import Prices	Export Prices (c)	Nominal Wages Rates	Average Weekly Earnings (d)
1956/7						
September	+1·9	+3·1	+1·0	+7·5	+1·3	+2·2
December	+0·9	+0·3	+1·0	+1·7	+1·3	+1·4
March	+0·9	−0·3	−0	+0·9	−0·2	+0·2
June	+0·9	−0·8	+1·0	+0·4	+1·2	+0·4
1957/8						
September	+0·5	−1·1	+1·9	−5·9	+0·3	+1·8
December	0	−1·7	+0·7	−13·3	0	+0·7
March	+0·7	−0·6	−0·7	−3·6	0	—
June	+0·7	−2·8	—	−3·8	+1·3	—
(Percentage change on preceding June)						
June, 1957	+4·7	+2·2	+2·9	+10·5	+3·8	+4·3
June, 1958	+1·9	−6·0	—	−24·3	+1·6	—

(a) Interim price index excluding potatoes and onions.
(b) Index of basic materials.
(c) Excluding gold.
(d) Per adult male seasonally adjusted.

Sources: Commonwealth Statistician, *Monthly Review of Business Statistics.*
Commonwealth Statistician, *Monthly Bulletin of Employment Statistics.*
Commonwealth Bank, *Statistical Bulletin.*

available,[4] it is impossible to overcome the upward pressure upon wages and prices. Just what degree of unemployment is required to remove this pressure has been the subject of hot debate. Clearly it differs among countries and at different periods of time but the effect of the recent unemployment hints at an answer for Australia.

The changes that have taken place in prices and wages during the last two years are shown in Table III. Retail prices increased by only

4. This would roughly correspond to the equality of persons seeking employment with registered vacancies in Table I, although regional disparities would have to be taken into account.

1·9 per cent between June 1957 and June 1958 as compared with 4·7 per cent over the preceding twelve months. Part of the relative stability is due to the fall in the price of basic materials. The changes in wholesale prices reflect this fall. Part is also due to wage policy. No change took place in the basic wage between May 1957 and May 1958 and the increases which did take place were both reasonably small.

The decisions of the Commonwealth Conciliation and Arbitration Commission were undoubtedly influenced by the balance of payments but this is only one side of the picture. If excess demand had been present there would have been a tendency for average weakly earnings to have risen without any need for increased award rates to push them up. In fact the movement in average weekly earnings is consistent with a small push from increased wage rates and almost no pull from demand. The increase in the basic wage in May 1957 seems to have passed into average earnings with a slight lag. It remains to be seen whether the slightly higher degree of unemployment has had any dampening effect on the way in which the increase in May 1958 has been passed into average earnings or whether some part might have been absorbed in over award payments.

In addition to retarding the rate of increase of average earnings so that they follow award wages fairly closely the removal of excess demand, with its associated price stability, has also had the effect of reducing the pressure for a wage push on the award rates themselves. The Commonwealth Arbitration Commission and State Wages Boards seem to have been able to hold wage rates fairly constant for long periods and finally raise them by small amounts without any strong union resistance and outcry.

But what has been the effect of the stability of prices and wages on productivity? Two opposing claims have been made in recent years. On the one hand it has been suggested that excess demand is a prerequisite to any rise in productivity. Industry, it is asserted, is stimulated by constantly rising prices and needs the pressure of excess demand to keep it in top gear. Any withdrawal of this pressure is likely to have adverse reactions on productivity with the attendant risks of stagnation and unemployment.

The opposite claim suggests that apart from the need to restrain price increases for balance of payments purposes there is reason to believe the removal of excess demand and the resulting increase in competition would step up productivity. Continuous inflationary pressure is likely to breed a little slackness which would soon be eliminated if excess demand were removed. It is true that a period of readjustment might be necessary in which the total level of output would drop slightly as some overtime disappeared, but it is argued, this would be a once for all drop and from then on output would proceed to rise steadily again. Further, the new rate of growth of output might even be higher than that taking place before the readjustment. This would be so if the removal of excess demand eliminated a few high cost

producers and led to a general tightening of efficiency on the side of both management and labour.

The first view has received a certain amount of support from the economic conditions which have prevailed in the United Kingdom since 1955 when monetary controls were applied to overcome inflations. Industrial production in 1956 was 0·5 per cent lower than in 1955 but rose by 1·5 per cent between 1956 and 1957. These rates compare with an average increase in industrial production of 7 per cent per annum between 1952 and 1955. Employment in manufacturing rose by 0·5 per cent between 1955 and 1956 and was constant between 1956 and 1957.

On the other hand the Australian economy seems to provide support for the second point of view. It is still a little early to see the complete picture and unfortunately no official indexes of industrial production or of real domestic product are available to assist analyses of this type. Nevertheless a glance at the movement of industrial production of most commodities over the first eleven months of 1957/8[5] is sufficient to show that the anti-inflationary measures applied during 1956 have not brought the level of output to a halt. The Australian and New Zealand Bank's Index of Factory Production summarizes these figures into the startling result that factory production in the first eleven months of 1957/8 was 8 per cent higher than in 1956/7. Factory production over the two previous years increased by 5 and 4 per cent respectively. Since the increase in factory employment in 1957/8 was approximately 1·5 per cent, a rough estimate of the increase in factory production per man would be over 6 per cent. For 1956/7 the increase in factory production per man was around 3 per cent.

4. *Recent Economic Trends*

Some of the factors contributing to the rise in production are shown in Tables IV, V and VI.

TABLE IV

Domestic Supplies

Source	1955/6	1956/7	1957/8	Change 1955/6–1956/7	Change 1956/7–1957/8
	£m.	£m.	£m.	£m.	£m.
Gross National Product—					
Non-farm (a)	4,859	5,201	5,460	+ 342	+ 259
Farm	438	535	359	+ 97	− 176
Total	5,297	5,736	5,819	+ 439	+ 83
Imports, etc.	1,022	914	1,019	− 108	+ 105
Less Exports, etc.	879	1,103	934	− 224	+ 169
Domestic Supplies	5,440	5,547	5,904	+ 107	+ 357

(a) Unfortunately it is not possible to remove farm wages from this item.

Source: *National Income and Expenditure 1957–58.*

5. These figures can be seen in the Commonwealth Statistician's *Monthly Bulletin of Production Statistics,* July 1958.

TABLE V

Absorption of Domestic Supplies

Expenditure	1955/6	1956/7	1957/8	Change 1955/6–1956/7	Change 1956/7–1957/8
	£m.	£m.	£m.	£m.	£m.
Personal consumption (a)	3,358	3,560	3,820	+ 202	+ 260
Gross private investment—					
Fixed capital equipment	939	948	1,019	+ 9	+ 71
Non-farm stocks	130	60	50	— 70	— 10
Farm stocks	24	— 30	—40	— 54	— 10
Public authorities	989	1,009	1,055	+ 20	+ 46
Gross Domestic Expenditure ..	5,440	5,547	5,904	+ 107	+ 357

(a) Includes financial enterprises.

Gross domestic expenditure increased by £357 m. or 6·5 per cent in 1957/8 compared with an increase of £107 m. or 2 per cent in 1956/7. Allowing for price changes there was a rise of approximately 4 per cent in real expenditure in 1957/8 and a fall of 3-4 per cent in 1956/7. The increase in domestic expenditure in 1957/8 was met partly from an expansion of domestic production and partly from an expansion of imports. The value of production in the non-farm sector of the economy rose by £259 m. or 5 per cent.[6] Using the interim retail price index as a deflator the real increase in non-farm production in 1957/8 was 2·6 per cent. For 1956/7 the comparable figure was 1·5 per cent. Taking account of changes in the work force the increase in non-farm product per head was about 2 per cent in 1957/8 and 1 per cent in 1956/7.

How do these figures compare with the increases in factory production indicated by the Australia and New Zealand Bank's index? As no industrial breakdown of the gross national product is available it is difficult to assess the proportion of gross non-farm product contributed by manufacturing with any degree of precision. However, we know that about one-third of the work force, excluding rural workers, is engaged in manufacturing activities and less than 50 per cent of the wages and salaries and company income in 1956/7 originated in manufacturing. Accordingly, as the increase in productivity in the service industries is probably negligible it seems reasonable to assume that manufacturing output per head is at least twice the total non-farm output per head. This would yield increases of at least 4 per cent and 2 per cent for 1957/8 and 1956/7 respectively. These figures bear the same relative relationship as the Australia and New Zealand Bank's estimates in the previous section but they are slightly lower in absolute terms. However, in view of the roughness of the statistical

6. Farm wages are caught up in non-farm product so that farm product is really only the income of farmers (excluding pastoral companies). In so far as falling farm incomes led to a lower farm wage bill in 1957/8, the percentage rise in non-farm product is an under-estimate. Current company reports also indicate that company incomes in 1957/8 may prove to be under-estimated.

calculations the two sets of estimates would appear to be consistent, so that further support is given to the thesis that economic stability might have given a fillip to productivity in Australia.[7]

Unfortunately the external picture is not so bright. The movements of export and import prices (see Table III) indicate that a strong deterioration has taken place in the terms of trade. In the first nine months of 1957/8 there was a 13 per cent fall in the terms of trade. The effect of this adverse movement in external productivity has been to reduce real national product by about the same amount as internal productivity has increased it. Our overall progress in 1957/8 has accordingly been negligible. The major impact of the reduction in external productivity has fallen on the farmer. To the extent, however, that non-farm incomes have lagged behind the improvement in internal productivity part of the burden has been absorbed by the non-farm sector.

TABLE VI

Indicators of Business Activity

(Percentage change on corresponding quarter of preceding year)

Period	Retail Sales	Motor Vehicle Registrations	Building Commencements			H.P. Balances Outstanding	Bank Advances
			Houses and Flats		Other		
			No.	Value	Value		
	%	%	%	%	%	%	%
1956/7							
September	+3·9	−19·1	−15·2	− 7·1	+ 9·2	+11·0	−4·8
December	+4·1	−12·7	− 8·8	− 6·1	− 5·2	+ 9·1	−5·4
March	+4·2	− 9·1	− 1·9	+ 0·5	−17·4	+ 9·5	−5·5
June	+4·5	+ 3·0	+11·0	+14·1	−18·0	+11·0	−3·0
1957/8							
September	+5·6	+ 3·1	+12·3	+16·5	−15·3	+11·5	−2·8
December	+5·6	+12·8	+ 0·3	+ 4·3	− 8·1	+14·7	+0·1
March	+5·7	+13·9	+ 4·4	+ 7·7	+ 9·3	+20·0	+3·8
June	—	+14·4	+ 3·3	—	—	+24·5	+8·8

Source: Commonwealth Statistician, *Monthly Review of Business Statistics.*

Despite the greater stability in retail prices in 1957/8 compared with 1956/7 retail sales continued to expand. Whereas the volume of sales in 1956/7 compared with the preceding year was approximately the same there was an increase of 3 to 4 per cent in volume in 1957/8. Professor Arndt has outlined the resemblance between 1956/7 and 1952/3 as years of domestic recession following boom years and balance of payments difficulties.[8] The data of Table V indicate that real conconsumption per head fell 2 per cent in 1956/7 and recovered strongly in 1957/8 with an increase of approximately 3 per cent.

7. This is far from the final word on the Australian situation but it should be noted that it would be very upsetting to find that the United States of America was the only country which responded when excess demand was removed.

8. H. W. Arndt, "The Australian Economy", *Economic Record,* December 1957, pp. 287-290.

The year 1957/8 has therefore produced some apparently curious movements. While unemployment has been gradually increasing consumer expenditure has also shown a steady expansion.[9] Perhaps consumer expenditure is going to prove just as resilient in post-war Australia as in the United States of America! Rising productivity has undoubtedly contributed to this result but it is difficult to avoid the conclusion that hire purchase has played an important role.

TABLE VII

Amounts Financed Under Hire Purchase Agreements

(Percentage change on corresponding quarter of preceding year)

Period	Motor Vehicles, Tractors, Etc.	Plant and Machinery	Household and Personal Goods	Total
1956/7				
September	+ 5·9	+ 36·3	− 15·8	+ 1·3
December	+ 9·5	+ 4·9	− 8·1	+ 4·7
March	+ 14·8	+ 20·5	+ 3·8	+ 12·1
June	+ 8·4	+ 24·3	+ 32·9	+ 14·5
1957/8				
September	+ 0·7	− 8·1	+ 69·0	+ 12·4
December	+ 12·5	+ 25·8	+ 55·2	+ 22·8
March	+ 20·5	+ 11·7	+ 61·2	+ 30·3
June	+ 26·3	+ 9·8	+ 50·3	+ 31·5

Source: Commonwealth Statistician, *Monthly Review of Business Statistics.*

The increase in outstanding balances of hire purchase finance businesses in 1957/8 was about 10 per cent greater than the increase in the preceding two years combined. While motor vehicles have been well supported an increasing share of the finance available has gone to household and personal goods. There seems little doubt that television has had the major influence on expenditure in this direction.

While it must be admitted that the expansion of hire purchase finance has assisted the growth of production during the past year it is nevertheless disquieting to find consumer expenditure expanding so lustily at a time when more expenditure should be undertaken on capital formation, both public and private, and further, that there is no simple way of controlling hire purchase if the need arises. All States must be concerned at the flow of funds into hire purchase companies at the expense of their public works. It would seem therefore that the time has arrived for co-operation between States in the direction of enforcing minimum deposit ratios, possibly combined with a maximum period of payment.

In addition concern has been expressed that something should be done to protect the consumer both on the borrowing and lending side.

9. It is interesting to observe that twelve months ago nearly all the complaints about unemployment came from employers and not trade unions. Labour did not seem to lose confidence as quickly as management and continued to spend. The result of this spending has been the gradual cessation of complaints about unemployment from employers while labour is only now beginning to be concerned.

There is clearly a need to ensure the public has adequate information about the financial strength of companies to which they are lending money. Legislation with regard to the issue of prospectuses and a tightening of control by Stock Exchanges could cover this matter. It should not be difficult also to frame legislation to protect borrowers by ensuring the conditions under which hire purchase finance is provided are clearly set out and that repossessions are controlled.

5. *Balance of Payments*

Despite the steady decrease in the price of wool and metals over the past year the fall in international reserves between June 1957 and June 1958 amounted to only £42 m. Earlier fears of a somewhat larger decline in international reserves were based mainly upon the assumption that imports would be slightly higher and the capital inflow slightly lower than the levels which actually obtained. The inflow of private funds was the same in 1957/8 as in 1956/7, but net receipts from government loans were £13 m. in 1957/8 compared with net payments of £3 m. in 1956/7.

TABLE VIII

Balance of Payments
(£A million)

	1955/6	1956/7	1957/8
Current Account—			
Exports f.o.b.	772	978	814
Imports f.o.b.	— 819	— 718	— 791
Trade balance	— 47	260	23
Invisibles (net)	— 190	— 167	— 201
Current account balance	— 237	93	— 178
Capital Items—			
Public and private borrowing	164	119	136
Movement in international reserves	— 73	212	— 42

Source: Commonwealth Statistician, *The Australian Balance of Payments*, 1953/4 to 1957/8.

Imports during 1957/8 failed to reach the target rate by £20 m. Although import restrictions were relaxed slightly in the second quarter of 1957/8 so as to allow the annual flow of imports to rise from £775 m. to £810 m., it is interesting to observe there was no change in the quarterly import rate. The quarterly flow of imports during 1957/8 compared with 1956/7 was as follows:

	1956/7 £m.	*1957/8* £m.
September quarter	190	196
December „	169	198
March „	172	199
June „	186	197

At the present level of import restrictions it would seem that a regular flow of imports should be maintained during the ensuing year and the total should not exceed £800 m. As there have been few complaints about import restrictions in recent months it might even be wondered whether they are really pinching very much, and what the effect would be if they were lifted. The disinflationary economic policy initiated by the supplementary budget of March 1956 has clearly had a marked effect on the demand for imports. If our export position were a little stronger it would certainly be worthwhile trying to remove the restrictions but it might not be wise to risk a run of imports now.

Owing to drought conditions the wool clip in 1958/9 will be about 3 per cent down on the 1957/8 clip. There is reason to believe wool prices will not sag any further but exactly when and by how much they are likely to recover is difficult to judge. Assuming the closing prices for wool are maintained during the coming year[10] the wool cheque could drop by £60 m. The outlook for wheat is very bright. The 1958/9 crop should reach and even surpass the post-war average of 160 m. bushels. Production in 1957/8 was 96 m. bushels. The effect would be to raise the export receipts from wheat by approximately £20 m.[11] If metal prices continue to hold and even rise very slightly, butter output improves, and industrial exports expand very slightly under the impetus of the recently instituted export consultative committee the drop in total exports could be £30 m. or less. A forecast of the balance of payments for 1958/9 would accordingly be as follows:[12]

	£Am.
Exports f.o.b.	785
Imports f.o.b.	800
Trade balance	— 15
Invisibles (net)	— 210
Current account balance	— 225

With an inflow of capital around £125 m. the fall in international reserves in 1958/9 would be of the order of £100 m. If the inflow of capital should drop to £100 m. the fall in international reserves would be around £125 m. With the level of international reserves at 30th June 1958 standing at £525 m. the deficit on the balance of payments for the coming year can therefore be faced with a certain degree of confidence. The recent announcement by the Minister for Trade that

10. The price used is the average for April-May 1958 of 54 pence, which is slightly below the closing price in June. This compares with an average of 62·45 pence for the whole of 1957/8 season.

11. Assuming the 1958/9 crop reaches 180 m. bushels and that 80 m. bushels are consumed at home we have 100 m. bushels of wheat available for export in 1958/9 against 63 m. bushels in 1957/8. If stocks are increased by 10 m. bushels, exports could rise by 50 per cent to yield an addional £20 m.

12. The balance of payments forecast may prove to be on the pessimistic side. Reports at present being received from U.S.A. are unanimous in declaring that the downward movement has been arrested. The strength of the upturn is still questionable but some assistance to export prices could be provided during the year.

import restrictions will not be altered seems to be a sound decision at this stage of the year.

6. *Economic Prospects and Policy*

Although the consequences of the prospective deficit in the balance of payments are not alarming when viewed against our international reserves it is nevertheless essential that this imbalance should be considered in the wider economic context of rising unemployment and stability of wages and prices, and the longer term movements of these factors. The rise in internal productivity and the relative stability of wages in 1957/8 has done much to improve our ability to compete with imports. Unfortunately falling export prices have more than offset any advantages gained on the import side. In the short period our international reserves can be used to take the strain, but if export prices do not recover, imports will eventually have to be reduced. In the meantime if no change takes place in external productivity, and prices in the rest of the world are reasonably stable, increases in wages cannot exceed internal productivity[13] without endangering the state of employment unless import restrictions are tightened still further, tariffs raised or the rate of exchange depreciated.[14]

In practice it seems unlikely that the rest of the world will maintain constant prices. In fact a long term upward movement in prices of around 1 per cent per annum might not prove disastrous and might even have some beneficial effects.[15] Unfortunately it is not possible to say how rapidly productivity is increasing in Australia but in view of the high and fairly constant proportion of national product that has been devoted to capital formation and our earlier discussion on productivity it would be upsetting to find the long term rate was less than 2 per cent per annum. This would permit wages to rise on the average at some 3 per cent per annum. The rate of increase of nominal wages in 1957 was well within this margin while the rate of increase of average weekly earnings was such as to give reasonable hope of accomplishing the objective in the longer term.

It should be the aim of economic policy to ensure this objective is achieved. The pull of excess demand should not be allowed to reinforce any wage slide, but at the same time demand should be adjusted

13. It is important to realize that wages can rise as fast as the average rate of increase of productivity without any effect on the general level of prices. There has been a tendency on the part of some people to think that because the wage bill is roughly 50 per cent of the national income, price stability can only be maintained if wages increase at half the average rate of increase of productivity. This is clearly not so. If productivity increases by 5 per cent and prices are constant, the national income will rise by the same amount. Wages and non-wage incomes can accordingly each rise by 5 per cent without affecting the balance.

14. If it is desired to correct the balance of payments deficit by wage adjustments it would be necessary to reduce wages to the extent of the loss of external productivity. If wages could be restrained within the limits of increases in internal productivity the balance of payments adjustments would in general be better undertaken through the rate of exchange.

15. It is important however to add that short-term expectations should not be allowed to become too certain or else any benefits of the long-term upward movement in prices will be lost.

to supply so as to absorb any increase in the work force and accordingly maintain economic activity at a near full employment level. If wage rates are pushed up too rapidly it may prove difficult for economic policy to operate effectively as the appropriate measures to safeguard employment can frequently only be taken with regard to the likely movement of export prices.[16]

The current situation provides an excellent illustration of this difficulty. We have seen that despite the stability of prices and wages in the past year there will be a substantial balance of payments deficit in 1958/9. The present level of import restrictions prevent the deficit from getting out of hand but the intensification of these restrictions to remove another £100 m. of imports would be neither economically desirable nor politically popular. The alternatives at this juncture are to depreciate the exchange rate or to wait and see whether export prices recover and in the meantime use up portion of our international reserves.

In 1957/8 the proportion of the national income earned by farmers was the lowest in the post-war period. If wool prices do not recover this proportion will be even lower in 1958/9. Depreciation of the exchange rate would improve these farm incomes and at the same time help to remove import restrictions. If it were thought that export prices would not recover a good case could be made for depreciating the exchange rate. But it is difficult to be sure about the future movement of export prices. The wheat outlook is very heartening, metal prices are hardening and it is still possible that wool prices might rise in the coming season. A revival of activity in the United States of America would tend to assist any upward movement. While it is true that farmers are receiving low incomes at present they have had a series of excellent years in the past and should accordingly be prepared to stand a few lean years.[17] Finally we have at last achieved price and wage stability and with reasonable international reserves we are in a much better position than hitherto to face the adverse balance of payments. It is of course rarely possible to give a cut and dried answer to problems of this type, but my own feelings are that on balance there are better reasons for leaving the exchange rate where it is than altering it, and that strong efforts to maintain economic stability and encourage internal productivity might be more rewarding.[18]

16. This emphasizes the fact that the government cannot indefinitely shirk its responsibilities with regard to wage determination. It may well be that the best way of safeguarding full employment and the balance of payments is for the government to make clear its opinions regarding the consequences of any wage claims before the Commonwealth Conciliation and Arbitration Commission.

17. If farmers are not so prepared the alternative is to set up a wool stabilization scheme. There is no reason why farmers should get all the advantages of a free market and none of the disadvantages.

18. Even though it is not possible to find conclusive evidence it is difficult not to feel that the high rate of capital formation in recent years must have made some contribution towards import replacement and that future development will do even more.

If these efforts are to be sucessful it is essential that the recent Commonwealth Budget should live up to the Treasurer's aim of maintaining a rate of expenditure in the economy in 1958/9 which will be only just "sufficient to support the necessary increase in activity but not more than that".[19] The economic effects of the budget can be best assessed by preparing a forecast of the demand and supply situation in 1958/9. Assuming that internal productivity increases by 2 per cent and that it is desired to raise the level of employment by 2 per cent,[20] the value of Domestic Supplies in 1958/9 in terms of prices at 30th June 1958 would be as follows:

	Forecast 1958/9	Change 1957/8 Forecast
	£m.	£m.
Gross national product	6,060	+241
Imports, etc.	1,030	+ 11
Less Exports, etc.	−910	+ 24
Domestic supplies	6,180	+276

This forecast also allows for the fall in export income indicated in the previous section.

Real personal consumption expenditure per head of population recovered in 1957/8 to the highest level in the post-war period. Assuming a further increase of 1 per cent in real personal consumption per head, personal consumption expenditure will reach £3,960 m.[21] Public authority expenditure may be estimated from the Commonwealth and State Budgets, while gross private investment may be estimated (or should I say guessed) from information relating to the trends of its main components. Collecting this information together yields an estimate of Domestic Expenditure in 1958/9 as follows:

	Forecast 1958/9	Change 1957/8 Forecast
	£m.	£m.
Gross private investment—		
Dwellings	230	+ 12
Other building	160	− 14
Trucks, cars, etc.	300	+ 14
Other capital equipment	330	− 11
Fixed capital equipment	1,020	+ 1
Non-farm stocks	50	—
Farm stocks	10	+ 50
Public Authorities	1,110	+ 55
Personal consumption expenditure	3,960	+140
Gross domestic expenditure	6,150	+246

19. Budget Speech, 1958–59, p. 3.

20. Raising employment by this amount implies that jobs would be available for the additional labour coming on to the market in 1958/9 so that unemployment would not get any worse. The present rate of unemployment would accordingly be substantially unchanged.

21. This figure includes expenditure by financial enterprises.

The overall result shows a slight deflationary gap of some £30 m. It is possible, though unlikely, that consumer's expenditure could be higher in 1958/9 but it seems more likely that investment in fixed capital equipment could be lower than the estimate given. Dwelling construction is picking up and could be a litle higher but non-dwelling construction could contract still further. Motor vehicle purchases recovered rapidly in 1957/8 and while still increasing they appear to be hesitating at the moment. Farm investment could show a substantial drop in 1958/9 and reduce the estimate for other capital equipment by £10 m.—£20 m. Finally the stock increase is not excessive and businessmen might well be prepared to raise their stocks by more than £50 m. in 1958/9.

It seems fairly clear the budget has been well framed for the purpose of ensuring that excess demand does not reappear in 1958/9. It seems equally clear that because of fears regarding the conversion of maturing debt the Government has been prepared to err on the side of deflation. Last year securities maturing in Australia amounted to £399 m., of which £345 m. were converted and the balance of £54 m. was redeemed. In 1958/9 debt amounting to £337 m. falls due. Since a significant part of this debt is war debt held by a large number of individual holders, the Treasury considers that redemptions might easily be as high as £80 m.

This raises several questions. In the first place why should a much larger proportion of this year's maturing debt be redeemed than last year. Even if there is more war loan maturing and the number of individual holders is larger, only £291 m. of the debt maturing is held outside Commonwealth Trust Funds. If the small holders of the war debt felt (quite unwarantedly) they had been tricked when cheap money was abandoned in 1951, do they still feel so strongly now and is this sufficient reason for not taking up new bonds at a higher rate of interest? This seems doubtful, but perhaps there are other even more important reasons. The holders of these bonds may not be prepared to convert because (a) they do not consider the rate of interest on new bonds to be high enough, (b) they may not consider bonds a good hedge against inflation, or (c) they may wish to use the money for some other purpose such as the purchase of durable consumer goods.

It may be thought that it is only if the money is to be spent on the purchase of goods and services that the Treasury should be disturbed from a budgetary point of view. In one way this is so, but if an increasing proportion of the public no longer has faith in bonds the Treasury must be even more careful to avoid an inflationary budget. It seems doubtful whether more than a proportion (perhaps 25 per cent) of the redeemed bonds would be devoted to consumption and this surely does not warrant great concern. It is a pity therefore the reasons for the uneasiness over the redemption of bonds were not given in the Budget. It is also a pity the Treasury's concern over the purely financial implications of the maturing debt induced it to mix fiscal and

financial policies in such a way as to lead to confusion over the true budgetary position.[22]

Even if the Government has to resort to central bank credit to finance its cash deficiency on current and loan account it should not be worried about tipping the scales towards inflation. The effect on the supply of money can be controlled by the central bank through the special accounts mechanism. Furthermore it should be easy to do this in 1958/9 as the expansion of money through treasury bill finance will be taking place at a time when international reserves are falling and could be used as a part substitute for a release of funds from special accounts in order to stabilize the banking position.

Whatever the reasons for the Government's action it is impossible not to rejoice at the application of strong budgetary policy. Ineffectual budgetary policy has been one of the main causes of Australia's post-war inflation. Nevertheless, it would have been possible to have given more attention to the needs of certain sections of the community. A little more generosity could have been shown towards pensioners and towards the family man in the lower income bracket. The latter could have been assisted by increased child endowment.

The time has not yet arrived however, when tax reductions can be made. So long as the present rate of immigration continues it is essential to increase our capital formation before allowing the proportion of consumption expenditure to rise. There was a welcome expansion of investment in 1957/8 and every encouragement should be given to increase this investment in 1958/9. The analysis of our prospects for the coming year suggests, though it is by no means certain, that the drift in unemployment may continue. At least there is no indication that the level of unemployment will decrease. Despite the risks associated with the balance of payments there are strong reasons for

22. The cash deficit of £110 m. relates to the deficit after taking into account all revenue and expenditure of the Commonwealth Government including receipts and disbursements from the debt maturing in 1958/9. The overall financial commitments of the Commonwealth which are set out in the Budget may be regrouped as follows:

	Actual 1957/8	Prospective 1958/9
	£m.	£m.
Requirements—		
State Loan Programme	200	210
War Service Land Settlement	9	7
Total	209	217
Source of Funds—		
Budget Surplus	105	24
Loan raisings	115	115
Sinking funds, etc.	62	48
Less bond redemptions	— 63	— 80
Total	219	107
Overall cash surplus or deficit	+ 10	— 110

believing the Commonwealth Government would have been taking a reasonable chance if it had underwritten a further £10 m.—£20 m. in the Loan Programme for State works and housing. It is of course still possible for such action to be taken when the Loan Council meets in January 1959, but time may no longer be on our side.

Monetary policy should continue to be eased. Encouragement should be given to investment, particularly farm investment. Advances during 1957/8 have steadily expanded and at June 1958 were 9 per cent higher than at June 1957. This action has been made possible by the release of some £60 m. from special accounts. However, despite these releases the ratio of liquid assets and government securities to deposits of the trading banks in June 1958 was standing at its lowest level for two years.

Australia has at last achieved internal economic stability. This is a major accomplishment for economic policy, particularly as there is reason to believe it has been accompanied by a favourable movement in our rate of growth. The coming year will again be one in which competition will be the key note in business. While the level of economic activity in 1958/9 should be greater than in 1957/8 there is evidence of growing excess capacity in some industries. Further the whole of the additional labour which will become available during the year is not likely to be readily absorbed and unemployment may even increase.

Further increases in unemployment must, however, be regarded with suspicion and anxiety. It is not easy to maintain just the right level of expenditure to balance demand and supply at full employment, but it should be remembered that while inflation may have its problem it is equally true that it would not be difficult for increased deflationary pressure to have adverse effects on business expectations and reduce the rate of investment. It is essential to ensure that an excessive preoccupation with price stability and the balance of payments deficit does not lead us into this pitfall. The rate of economic development that has been so carefully nurtured in the post-war period must not be allowed to slow down.

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AUSTRALIA AND EUROPEAN FREE TRADE

Part I of this article summarizes for the benefit of Australian readers the main facts about the European Economic Community (or Common Market) and about the negotiations for a Free Trade Area. Part II assesses the probable effects of the European Economic Community on Australia's exports. Part III considers the effects of the various Free Trade Area proposals on Australia. Part IV suggests suitable policies for Australia to follow in prospective negotiations.

I

The European Economic Community Treaty and the Free Trade Area Negotiations[1]

European Economic Community

In 1953 six European countries—France, Germany, Italy, Holland, Belgium and Luxembourg—established a common market in coal and steel called the European Coal and Steel Community. Within this Community all customs duties, restrictions and discrimination in transport rates affecting coal, steel and steel-making materials were abolished. In June 1955 the Foreign Ministers of these six countries met at Messina and decided to work towards a common market for all products, not just coal and steel. This project became known as the Messina Plan. A committee headed by M. Spaak of Belgium prepared a detailed report on these proposals in April 1956, and a month later this report was approved by the six governments. In March 1957 they signed a Treaty in Rome instituting their customs and economic union, to be called the European Economic Community. So events moved fast. The Treaty was ratified by each of the governments in the course of 1957, and officially entered into force on 1st January, 1958.

The most important feature of the Treaty is that (a) tariffs and other trade restrictions *between* the Six will be gradually removed until they make up an area of completely free trade, and (b) a common *external* tariff will be gradually established, so that eventually they each levy the same customs duties on goods imported from the outside world. The removal of internal tariffs is to be in three stages, the first

1. The Treaty has been published in English by the Secretariat of the Interim Committee for the Common Market and Euratom, Brussels (distributed by H.M. Stationery Office, London). A useful survey of the European Economic Community and the proposed Free Trade Area, with a discussion of the effects on Australia, is in *Overseas Trading*, 19/3/58 (published by the Commonwealth Department of Trade). Apart from articles in *The Economist* and *The Banker*, valuable references are *European Free Trade: A Survey for Industrialists* (Federation of British Industries, April 1957), *Economic Survey of Europe in 1956*, Ch. 4 (U.N. Economic Commission for Europe, Geneva, March 1957) and "The Free Trade Area Proposals: A Symposium", *Bulletin of the Oxford Institute of Statistics*, February 1957.

stage lasting from 4 to 6½ years, and the other stages 4 years each. At the end of the first stage there will be at least a 25 per cent reduction of the duty on every product, at the end of the second stage at least a 50 per cent reduction, and at the end of the third stage all remaining duties will have been removed. The tariff reductions will begin 1st January, 1959, with 10 per cent reductions. The common external tariff is to be established by stages in a similar way. It will be an average of the four existing tariff rates (France, Germany, Italy and the Benelux customs union), but with various modifications, usually upwards.

The Treaty has the following other important provisions:

(a) A common agricultural policy is to be established, involving a common managed (but not free) market in agricultural products.

(b) The various overseas territories (and some former territories) of the member countries are to be associated with the Community in a special way. Imports from these Associated Territories will eventually enter the Community free of tariffs and other restrictions. The Associated Territories will be required not to discriminate between imports from any of the six Community countries but they will still be allowed to impose non-discriminatory tariffs.

(c) A European Social Fund and a European Investment Bank will be established, as well as a Development Fund for the Associated Territories, France and Germany being the main contributors to the latter.

(d) It is intended to achieve eventual freedom of movement of capital and labour within the Community, rules of fair competition, a common transport policy, the "harmonization" of social policy, and particularly common policy of equal pay for men and women for the same work, and the alignment of general economic policies and legislation so far as is needed to make the Community work.

(e) Various institutions to conduct the Community have been or are to be set up—an Assembly, a Council of Ministers, a Commission, and a Court of Justice. The European Commission will be the main executive body.

At present European agricultural trade is subject to many forms of government intervention of which tariffs are only one. While the Treaty provides for internal tariffs to be eventually removed, and a common external tariff to be established, other forms of intervention are to be co-ordinated rather than removed. The Treaty mentions that co-ordination will consist either of common rules concerning competition, the compulsory co-ordination of the various marketing organizations, or a European marketing organization. Specific arrangements are to be worked out by 1960; a European agricultural conference in July this year made a beginning with a study of the facts and issues. The Treaty provides that during the transitional period long-term

contracts between member states and a system of minimum prices will regulate agricultural trade.[2]

The motivating force of these far-reaching plans is as much political and emotional, as economic. The six nations with a combined population of 160 million hope to establish a political and economic unit comparable to the United States and the Soviet Union. They hope to achieve the benefits of large-scale markets to which they believe much of the industrial success of the United States is due. For many Europeans the *mystique* of a United Europe has replaced the emotional hold of nationalism or Marxism.

The main problem in the Community will arise from members' balance of payments difficulties. The Treaty provides that in emergencies import restrictions will still be permitted, but there must be discussions with the other countries, and the use of restrictions should if possible be avoided. It is recognized that too much use of restrictions in emergencies would negate many of the benefits of the Community. In the absence of import restrictions or exchange rate adjustments countries will have to rely either on internal deflation or on credit arrangements, whereby countries in difficulties obtain sufficient credits to tide them over temporary crises. While the advent of General de Gaulle appears unlikely to affect France's adherence to the Treaty, the continued French balance of payments difficulties create almost insoluble problems for the Community at its very outset. Given French economic and political policies and a continued refusal to adjust the exchange rate, it is at present difficult to envisage any reduction in French trade barriers against the other Community countries.

European Free Trade Area

Faced with the imminent establishment of a European Economic Community which would discriminate against countries outside it, and which might strengthen the competitive position of its members in third markets, the United Kingdom put up in July 1956 the proposal for a European Industrial Free Trade Area. This Free Trade Area was to include the United Kingdom, the European Economic Community countries, and any other members of the O.E.E.C. who wished to join (notably Austria, Switzerland, and the Scandinavian countries). Tariff reductions within the Free Trade Area were to proceed concurrently with the reductions in the Community. The Free Trade Area would not substitute for the Community but would include it; the Community would be a smaller circle within the larger circle of the Free Trade Area. Apart for membership, the Free Trade Area would differ from the Community in three ways:

(a) Members would not have a common external tariff. Thus while in the Community the French and German tariffs on imports from Canada would eventually have to be the same, in the Free Trade

2. See E. M. H. Lloyd "Agriculture and the European Plan", *Lloyds Bank Review*, April 1957, and *Agricultural Commodities and the European Common Market* (F.A.O. Commodity Series, Rome 1957).

Area the British tariff on imports from Canada could be lower than the French and German one. If the United Kingdom joined the Community she would have to increase her tariffs on many imports from Commonwealth countries, but in the Free Trade Area this would not be necessary. So a Free Trade Area would conform with her Commonwealth obligations.

(b) The Free Trade Area would not include agricultural products (including feeding-stuffs, tobacco and processed foods). In a memorandum published in February 1957, the U.K. Government justified this by the need to protect her home agriculture as well as to continue Commonwealth preferences on foodstuffs.[3]

(c) The Free Trade Area would not aim at such close economic integration as the Community; in particular it would not aim at the free movement of labour, nor would there be a range of supra-national authorities and funds.

The principal technical difficulty in the Free Trade Area proposal is concerned with the definition of origin of goods. If member countries have different external tariffs a possibility of evasion of high tariffs exists. Goods from outside the Area would tend to enter the Area through low tariff countries. The problem would be overcome if all goods traded within the Area had to have Certificates of Origin. These would present numerous difficulties, particularly in the case of goods which are imported into the Free Trade Area in a semi-finished state, and where only part of the finished product is of Area origin. Although an O.E.E.C. Working Party in February 1957 concluded that these difficulties could be overcome,[4] the fact remains that because of these Certificates of Origin it would not be possible to dismantle customs barriers within the Area.

In 1957 the O.E.E.C. Council of Ministers agreed in principle to set up a Free Trade Area, and set up Working Parties to examine details. But the United Kingdom proposal has not been acceptable to other O.E.E.C. members, and the negotiations have run into increasing difficulties. At present it seems doubtful whether the Area will be established by January 1959 (in time for the tariff reductions in the Community and the Area to run together), and in fact whether it will be established at all. The most serious blow to the negotiations came early in 1958 when the French Government submitted a memorandum to its fellow Community members which appeared to be hostile to the whole Free Trade Area idea. Since then discussions have been taking place among Community members to establish a common view, and alternative proposals, designed to save the Free Trade Area or overcome some of the difficulties, have been put up by Germany and Italy. In 1957 negotiations were held up by the pre-occupation of the Six

3. *A European Free Trade Area* (U.K. Memorandum to the O.E.E.C., Cmnd 72, February 1957).

4. *Report on the Possibility of Creating a Free Trade Area in Europe* (O.E.E.C. Paris, January 1957).

with getting the Community under way; in the early part of 1958 they were held up by French political instability, and now they await the French constitutional referendum. Recent political developments may have hardened the French position.

The French memorandum has not been published, but French objections (and to a lesser extent the objections of other O.E.E.C. members) to the U.K. proposal seem to be along the following lines:

(a) The Free Trade Area plan is a subtle attempt by Britain to destroy the European Economic Community.

(b) France will not be able to win the same concessions for her protectionist point of view in the Area as she has in the Community.

(c) British industrial exports would gain entry into French markets but French agricultural exports would not gain free entry into U.K. markets.

(d) Differing external tariffs will enable goods from outside the Area to be smuggled in via the low-tariff countries—and no Certificates of Origin procedure could overcome this.

(e) The United Kingdom gets the best of both worlds by keeping its privileged Commonwealth market while gaining preferential entry into the Community.

(f) There will be no safeguards in the Free Trade Area—no arrangements for "harmonization of costs" or for helping industries in difficulties (safeguards which exist in the Community).

(g) The Area is a purely commercial, and rather negative plan, while the Community has the political motive of furthering the unity of Western Europe.[5]

The final shape of the European Economic Community Treaty was heavily influenced by the need to ensure French participation. Provision for a Development Fund for the Associated Territories, for the "harmonization" of social costs, particularly for the extension of the equal pay equal work principle beyond France, as well as numerous safeguard clauses, reflect primarily French influence. It also appears that the Community's common external tariffs will tend to be high, often higher than the arithmetic average of actual existing duties, and so closer to existing French and Italian than German or Benelux levels. Naturally the French feel unsure of being able to gain similar concessions in the larger Free Trade Area although, at the same time, these considerations explain why the German approach to the Free Trade Area proposal is sympathetic.

5. The state of negotiations and the various issues have been discussed in articles in *The Economist*, 1/3/58, 15/3/58, 22/3/58 and 5/4/58. Particularly good discussions of the French view are in *The Eastern Economist*, 7/2/58, p. 347, and 14/3/58, p. 573. See also J. Hennessy "The Free Trade Area Through German Eyes", *Lloyds Bank Review*, January 1958.

II

Effects of the European Economic Community on Australia

Direct Effects

The direct and immediate effect of the European Economic Community on Australia's exports is likely to be small or zero. Table I shows the value of Australia's exports to the Community. In 1956/57 these were £238m. or 24 per cent of our total exports. Imports from the Community were £71m., so that we had a trade surplus with the six countries of £167m.[6]

TABLE I

Australian Exports to European Economic Community Countries, 1956–57

£A million

Wool	187·1
Hides and skins	18·9
Wheat	5·9
Barley and oats	5·2
Lead and zinc metal, concentrates and scrap	3·9
Butter	2·3
Meat	1·0
Apples and pears	0·6
All other	12·9
	237·8

But 80 per cent of exports consisted of wool, and another 8 per cent were sheepskins. Here there is unlikely to be any direct effect. None of the Community countries has any tariffs on raw wool or sheepskins at present, and there will be no external tariff for the Community. It is possible that if the Community succeeds in its intention of raising the real incomes of its members the demand for wool will rise as a result. On the other hand the widening of the European market due to the removal of trade barriers may improve the efficiency of European synthetics production and so lower the relative costs of synthetics. But this factor is unlikely to be very important since total synthetic production is at present only very small in relation to European wool consumption, and since much of it is of filament yarn which is not directly competitive with wool.[7]

Our metal exports to the Community at present consist mainly of lead and zinc concentrates, which are also at present not subject to tariffs and where the common external tariff will be low or zero. Wool and metals are our only important non-agricultural exports to the Community. It would be a different matter if we ever became an exporter of, say, aluminium. At present Italy has a 25 per cent duty,

6. This is the *visible* surplus only. There was a small *invisible* deficit of £16m.

7. For a thorough discussion of the effects of European integration on the demand for wool, on which this paragraph is based, see R. J. Cornish "The Proposed Free Trade Area and Western European Demand for Wool", *Quarterly Review of Agricultural Economics* (Bureau of Agricultural Economics, Canberra), July 1957.

France a 20 per cent duty and Germany a 12 per cent duty on imports of unwrought aluminium. The common external tariff is likely to be nearer the present French and Italian level and would mean that while imports from French West Africa could enter the Community free of duty, imports from Canada or Australia would pay anything up to 20 per cent. Australia is at present an exporter of unwrought lead and zinc metal, as well as concentrates, but while some of the concentrates are sold to the Community our metal exports go principally to Britain, the United States, Japan and India. If we tried to export the metal instead of the concentrates to, say, Germany, we would find that, while imports from Belgium could come in freely, our metal would have to pay the common external tariff of about 10 per cent.[8]

Australian agricultural exports (excluding wool, hides and skins) to the Community added up to only £20m. in 1956/57, less than 10 per cent of all our exports to the Community and about 2 per cent of total exports.[9] These figures put any problem into perspective. The main items are wheat and barley (£11m.). Though the detailed agricultural arrangements in the Community are not yet known, it is likely that they will protect the interests of Community farmers at the expense of outside suppliers. French wheat, being "soft", is a close competitor of ours, and we can expect to lose markets (both potential and actual), though this might be partly offset by reduced French wheat exports to Britain. Our exports of apples to the Community are of significance in some years, but here our position may be protected by the fact that we market in the European off-season.

Indirect Effects

The establishment of the European Economic Community could affect our exports to outside countries, notably Britain. If a Free Trade Area to envelop the Community is not established, Britain could lose industrial markets in Europe and elsewhere. This might reduce her imports from Australia, not offset by greater Community imports from us. But such an effect would be small, if any. If the Belgian textile industry gains at the expense of Yorkshire, Belgian wool purchases would rise to compensate for lower British purchases. On the other hand, reduced British purchases of metals might be balanced by greater Community purchases not from Australia but from their Associated Territories.

The establishment of the Community might reduce the outflow of capital from Britain to Australia. Capital might be required for her own industrial readjustments, and if her real income falls funds available for investment would fall. Furthermore, British balance of pay-

8. At present Germany has only a 5 per cent tariff on zinc (unwrought) and no tariff on lead. But the French tariff on zinc is 12 per cent and on lead 8 per cent, while the Italian tariff on both is 13 per cent. At the time of writing the common external tariffs for metals had not been fixed; but they will probably be higher than the arithmetical averages of the existing tariffs, close to the French and Italian levels.

9. See Table I; also *Overseas Trading*, 19/3/58, *op. cit.*

ments troubles associated with a falling-away of export markets could induce a U.K. government to limit the flow of capital to the outer sterling area and compel the funds to be employed in reorganizing British industry.

Finally, the Community's agricultural arrangements could affect the markets for our agricultural products in Britain. On the one hand, Dutch butter and French wheat may be diverted from British to German markets, the losses to us in Germany being offset by gains in Britain. On the other hand there is a danger that European agriculture will be strengthened and developed by the new management, with the by-product of increased exports to Britain. At present exports of wheat, butter and canned meat from the Community compete with our exports. The Community's agricultural arrangements will forbid dumping within the Community, so that when France has a good wheat harvest she will have to dump her surplus in Britain rather than Germany. The Community's bargaining position will be strong, so that counter-measures by Britain or Australia will be more difficult.

Conclusion

This analysis has explored some remote possibilities and elaborated on very indirect effects. The main conclusions are that (a) wool is our main export to the Community, and it is unlikely to be much affected, and (b) any effect on our other agricultural exports is likely to be adverse though, in terms of figures, not very significant. Losses will be more of potential than of actual exports. Australia will not be one of the important losers from the establishment of the European Economic Community. The main sufferers will be our fellow Commonwealth members, India, Ghana, Canada and Britain, as well as Switzerland, Japan and the countries of Latin America.

III

The Free Trade Area and Australia

If an Industrial Free Trade Area were established on the lines of the United Kingdom proposal the further effects on Australia would also be negligible. Agriculture would be excluded, and Australia's other exports to Britain do not compete with products exported by members of the Community. The main losers within the Commonwealth would be India and Hong Kong, exporters of textiles. The Community countries as a whole are not net exporters of lead and zinc metal. The Associated Territories of the Community would not be associated with the Free Trade Area, so that there would be no prospective danger from the development of metal industries there.

The dangers as well as the potential gains to Australia will arise if Britain is compelled to make concessions to the European viewpoint for the sake of saving the Free Trade Area concept. There are then three main possibilities, and various combinations of them: (a) the ending of preferences for Commonwealth agricultural exports in the British market; (b) the establishment of an Industrial Customs Union

(and not just a Free Trade Area) to include Britain; and (c) the partial or complete inclusion of the Commonwealth in a wider Free Trade Area, similar to the inclusion of the Associated Territories in the European Economic Community.

(a) At present Commonwealth agricultural produce enters Britain generally free of duty. Protection to home agriculture is by means of subsidies, not tariffs or quotas. But there are tariffs on imports of certain products from outside the Commonwealth, and these represent the preferential margin from which Commonwealth exporters benefit. Britain may be compelled to remove these preferences. Either she may let in imports from other Free Trade Area countries free of duty, while keeping the tariff on imports from countries such as Argentina, or she may sweep away all duties on food imports altogether. At present Australian exports of only a few products—dried, fresh and canned fruit, wine, canned beef and sugar—benefit significantly from preference.[10] These account for less than a fifth of our exports to Britain—about £45m. Only a part of our sugar exports is sold at the free market price plus preference; the rest is sold at an annually negotiated price on the basis of the Commonwealth Sugar Agreement.

(b) If Britain agreed to an Industrial Customs Union all the problems connected with the definition of origin of industrial goods would disappear. The key distinction here between a Customs Union and a Free Trade Area is that while *within* both there is free trade, there is a single external tariff *around* a Customs Union, while the members of a Free Trade Area can have different tariffs for goods coming from outside the Area. If Britain joined a Customs Union (perhaps becoming a member of the European Economic Community with respect to everything except agriculture) she would then have to raise her external tariffs on imports from the Commonwealth to those of the European Economic Community. If the common external tariffs are fixed as averages of the present British tariffs and the present tariffs of the other member countries, the common tariffs would probably be lower than the external tariffs of the Community alone. Assuming processed foods are excluded from the Industrial Customs Union, the only Australian products affected would be zinc and lead metal. While zinc metal from Belgium would be able to enter Britain free of duty, Australian metal would have to pay the common external tariff. The effects would be even more damaging on exports of textiles from India and Hong Kong.

But this possibility appears most remote. To begin with, it would not only remove Commonwealth preference on the goods concerned; it would set up an "anti-preference". Furthermore, if

10. See W. R. Carney, "The Ottawa Agreement Now", *Economic Record*, May 1956.

the Customs Union included the Associated Territories of the Community, Britain would be giving imports from French colonies preference over imports from British colonies, while if it excluded the Associated Territories it would conflict with the Community Treaty. And if imports from the Associated Territories were allowed to enter freely into Community countries but not into Britain, while Community imports could come freely into Britain, there would then still be a definition-of-origin problem. Instead of Commonwealth exports slipping into the Community via Britain, Associated Territories exports would slip into Britain via the Community.

(c) A third possibility is that part or all of the Commonwealth enters the Free Trade Area in the same way as the Associated Territories are part of the Community.[11] There are many degrees of such a move but in its full sense it would be radical. It would mean the end of Commonwealth preference. On balance the gains to Australia would probably outweigh the losses. Britain would be a net loser, compared with the establishment of a limited Industrial Free Trade Area on the lines of her original proposals, but she might be prepared to pocket the losses for the sake of avoiding the greater losses of being shut out of Europe.

All members of the European Free Trade Area would have equal access to the markets of the Commonwealth and the Associated Territories. Thus the Commonwealth and the Territories would not necessarily cut their protective tariffs, but would cease granting preferences to their mother countries. Britain would sell more to French Africa and France more to Australia. Australia would gain by being able to buy on the cheapest market.[12] Commonwealth and Associated Territories imports would enter freely into all parts of the European Free Trade Area. Australia would lose her preferences in the British market, but would avoid being discriminated against in the European market. If these arrangements do not include agriculture the effect on Australian exports would not be significant; if they do, then there might be a significant switch of those of our exports benefiting from preferences from Britain to Europe, but it is difficult to say whether on balance we would gain or lose.

This is the most radical version of this possibility. A more limited version is that Britain continues giving us preferences in her market, and we do not gain free entry into the Community market, but we reduce our preferential tariff margin on imports

11. The suggestion is made, for example, by A. C. L. Day "Salvaging the Free Trade Area", *The Listener*, 1/5/58.

12. Protection of Australian manufacturing industry need not be affected by the ending of Commonwealth preference. In some cases the elimination of preferential margins would simply mean a shift in the source of imports from Britain to other European countries. If total imports would rise as a result, the elimination of preferences would have to be accompanied by some increase in the tariff rate (i.e. in the tariff applying at present to British imports and which will then apply to all Free Trade Area imports).

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from outside Britain. This would be to the gain of the Community countries and to the loss of Britain. A reduction in Commonwealth preferences might be the *quid pro quo* France would accept in return for consenting to an Industrial Free Trade Area similar to the original United Kingdom proposal. From our point of view there would be the potential loss of the reserve bargaining power inherent in the preferences, but tne direct and actual gain in cheapening our imports.

IV

Australian Policy

In this maze of possibilities, where does the Australian interest lie?

Need for Agricultural Stabilization

The direct effects of the European Economic Community on present exports to Europe need not worry us, though it will certainly worry other outsiders such as Brazil, Ghana, Japan, not to speak of Britain. But the arrangements for agriculture, though still quite indefinite, have certain potential dangers.

The European Economic Community will in fact introduce regional agricultural stabilization schemes in the same way as Britain stabilized her post-war agricultural trade with some countries on a bilateral basis by means of long-term contracts. These regional arrangements often have benefits when compared with no stabilization at all, but they frequently work out to the loss of countries trading in the same products but not parties to the agreement. A counter-move would be to re-establish Commonwealth long-term contracts. But in competitive regionalism lies disaster for world trade. It is preferable that commodity trade be regulated by a world-wide multilateral system in which all producing and consuming countries have a say. Taking a long view, a unified world wheat market, regulated on the lines of the International Wheat Agreement, is preferable to the Europeans having their own arrangements—over-influenced by French protectionism—while Australia tries to gain privileges in the United Kingdom market.

Britain seriously weakened the International Wheat Agreement by withdrawing from it in 1953; the agricultural support and commodity stockpile policies of the United States have been the main upset in world commodity markets in recent years; and Australia herself has refused to take part in any stabilization scheme for wool, so that her advocacy of international commodity stabilization would hardly be lily-white. We have all offended, but it remains true that at this stage we ought to encourage *international* stabilization not necessarily as a preferable alternative to free trade, but as an alternative to European protective regionalism.

Readiness to Abandon Commonwealth Preferences

Just as the direct effects of the European Economic Community need not worry us, so the establishment of an Industrial Free Trade Area on United Kingdom lines would affect us very little. The real

problem arises when the Community countries finally present Britain with the alternative of no Free Trade Area at all or one of the arrangements discussed above, all of which would affect Commonwealth preference. At that stage Commonwealth countries will enter the negotiations directly, and the U.K. response will depend very considerably on Commonwealth attitudes.

The effects on members of the Commonwealth of a total or partial ending of preferences will vary. If the preferences are reduced or ended only in the markets outside Britain then Britain will be the only significant loser, and this loss may be a fair exchange for the gain of a European Free Trade Area. If the preferences are ended also in the British market the effects on some colonies and Commonwealth members may be significant. But the Australian loss would not be great enough to justify blocking a solution. A subsidy of a few million pounds would offset the effects on the export industries concerned.[13] Because our import preferences are probably more effective in raising our import prices than the preferences in Britain are in raising our export prices there would be a net gain to us from an all-round ending of the whole preference system. Furthermore, in return for agreeing to a reduction in preferences we may be able to obtain from the Community countries either preferential entry into their market or concessions to our viewpoint when their agricultural arrangements are discussed.

Pressure through G.A.T.T.

Finally, the Community's agricultural arrangements and the levels of its external tariffs might be influenced by pressure through G.A.T.T. The rules of G.A.T.T. allow customs unions, but do not allow (a) the establishment of new preferential arrangements other than customs unions, or (b) external tariffs for a customs union which are higher or more restrictive than existing duties. It is arguable that the Associated Territories will be linked to the Community in what is not a customs union but simply a preferential arrangement, and that the Community's external tariffs will in some cases be higher than the average of existing tariffs. But can G.A.T.T. be more than a sounding-board? Commonwealth countries are not in a strong moral position when preaching against new preferential areas, and there is little sign so far that Community countries intend to take much notice of the doubts expressed through G.A.T.T. by a large number of countries, including Australia. In the final analysis it may be necessary to offer something in return if the adverse effects of the Community on Britain and other members of the Commonwealth are to be avoided.

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13. At present most of the export industries concerned, notably sugar and dried fruits, benefit from a home price scheme, which means in effect that exports are subsidized by home consumers. If preferences were removed a direct export subsidy financed by the Treasury might be added. The net effect would be that the volume of exports would be the same as before, but the subsidy would enable producers to market their produce at the reduced prices brought about by the ending of preference.

TRADE AND REDISTRIBUTION OF INCOME IS THERE STILL AN AUSTRALIAN CASE?

I

Anyone reading the first issues of *The Economic Record,* which appeared in the mid-'twenties, cannot fail to notice how alive among Australian economists the tariff issue was in those days. Using *The Economic Record* as a gauge, economists' interest remained alive during the 'thirties. However, since 1938, with the exception of one article in the December 1945 issue, authors have paid little attention to Australian trade protection as a policy. In the meantime tariff theory has been further developed.

Government-sponsored investigation of the Australian policy of protection dates back to the late 'twenties and resulted in 1929 in the publication of a notable report on the economic effects of the Australian tariff. This report incorporated a serious attempt to estimate the cost of Australian protection. Protective tariffs were mainly justified on the grounds that they had assured workers of a larger share in the Australian national income, thus stimulating an increase in population.

The technical problem of estimating the cost of protection was taken up again recently in an article by Dr. W. M. Corden in *The Economic Record* of April 1957. In the present article attention is concentrated on developments in that field of tariff theory which concerns itself with the effects of trade upon the domestic distribution of income. The approach is largely historical and the article mainly in the nature of a progress report, but at the end a few brief observations are made with regard to the applicability of the theory to the Australian scene. Particular and detailed consideration is given to the earlier Australian contributions which stimulated the development of this part of the theory of tariffs.

The classical theory was not able to explain adequately how the gains from trade are distributed between different factors of production such as, for example, "Land" and "Labour", and according to Metzler,[1] as far as international trade theory was concerned, "the theory of distribution did not become a systematic part of international economics until the interwar period of the present century".

The foundations for a more modern and systematic approach to the problem of the effects of trade on the distribution of income were laid by E. F. Heckscher, in 1919, in an article in the Swedish *Ekonomisk Tidskrift*.[2]

Heckscher's treatment was later refined and elaborated by Bertil Ohlin[3] and is nowadays usually referred to as the Heckscher-Ohlin

1. Lloyd A. Metzler: The Theory of International Trade, Ch. 6, p. 237, *A Survey of Contemporary Economics* (ed. Howard S. Ellis).

2. For a recent translation of this article see *Readings in the Theory of International Trade,* American Economic Association, No. 13 (Blakiston, 1949).

3. *Interregional and International Trade* (Cambridge: Harvard University Press, 1952).

theory[4] which, simplified and summarized, runs as follows: Commodity price differences explain trade between countries; different factor prices explain differences in commodity prices; and differences in relative abundance of the factors are the main reason behind factor price differences.[5]

In the interwar period, after Heckscher's contribution, most economists would have agreed that international trade could have an effect upon the share in the national income of the factors of production. But although it was realized that Labour could lose from the removal of a tariff on manufactured goods if it entered heavily into their production, many economists, such as Haberler[6] and Ohlin,[7] thought it doubtful whether Labour would lose in an absolute sense as well as relatively. It was thought by such economists that the rise in the total national income occasioned by trade would more than offset a relative worsening of Labour's share in this income. Viner,[8] however, pointed out that an absolute as well as a relative worsening of the position of Labour was quite conceivable.

II

In Australia the problem of the effects of trade upon the national distribution of income entered the tariff discussions in 1925 in an article by J. B. Brigden.[9] The ideas contained in this article had a great

4. A very helpful abbreviated account of this theory can be found in P. T. Ellsworth's *International Economics* (1st ed., Chs. V and VI).

5. The Heckscher-Ohlin theory gave rise to the so-called "Heckscher-Ohlin law of factor price equalisation". This law states that trade will tend to make a country's relatively scarce factors more abundant and its relatively abundant ones more scarce and will therefore tend to decrease the price of the former and increase that of the latter. This tendency for international trade to equalize factor prices such as wages, interest, rent, etc., was, according to Ohlin, not likely to be complete. More recently, however, both Lerner and Samuelson showed that under free trade and in the absence of transport costs, complete equalization of the prices of the factors of production, both absolutely and relatively, would have to occur. Haberler, on the other hand, is of the opinion that the many assumptions underlying Lerner's and Samuelson's conclusions are so restrictive and unrealistic that, although formally correct and of pedagogic value, their findings "can hardly be regarded as a valuable contribution to economic theory". Balogh and Meade have also shown themselves to be concerned about these assumptions. The reader is referred to the following literature:

Abba P. Lerner: "Factor Prices and International Trade", *Economica*, Feb. 1952.

Paul A. Samuelson: "International Trade and the Equalization of Factor Prices" and "Factor Price Equalization Once Again" in *The Economic Journal*, June 1948 and June 1949 respectively.

Gottfried Haberler: "A Survey of International Trade Theory", *Special Papers in International Economics*, No. 1, Sept. 1955, Princeton University, pp. 19-20.

T. Balogh: "Static Models and Current Problems in International Economics", *Oxford Economic Papers*, June 1949.

J. E. Meade: *Problems of Economic Union*, p. 61, and *Trade and Welfare*, Chs. XXI-XXIII.

Also: S. F. James and I. F. Pierce: "The Factor Price Equalization Myth", *Review of Economic Studies* 1951-52, XX (2), and P. A. Samuelson: "A Comment on Factor Price Equalization", a reply in the same issue.

6. Gottfried Haberler: *The Theory of International Trade*, 3rd impr., pp. 193-195.

7. *Op. cit.*, p. 307.

8. Jacob Viner: *Studies in the Theory of International Trade*, pp. 193-4.

9. J. B. Brigden: "The Australian Tariff and the Standard of Living", *The Economic Record*, November 1925.

influence upon the later findings of a committee of experts[10] which findings have since been regarded in Australia as a scientific justification of the Australian policy of protection. It is therefore of importance to deal with Professor Brigden's article in some detail.

In presenting his case Brigden began by stressing that Australian conditions differed radically from those that prevailed in England in the first half of the nineteenth century when the case for free trade was vigorously pushed in that country. In England, at that time, existing tariffs were on agricultural products and favoured the landed classes. Free trade was in the interest of manufacturers and industrial workers and therefore of the rapidly increasing city population. In Australia, on the other hand, tariffs have been on manufactures and it was Brigden's thesis that they have protected the standard of living of increasing numbers of wage earners.

As an argument in favour of tariffs based upon the desire to redistribute the national income, the case presented by Brigden in 1925 in support of the Australian policy of protection in the past was not altogether clear-cut. His case was by no means exclusively based on the argument that tariffs can achieve a—politically desired—redistribution of income. It differed in presentation from the usual approach and intertwined were several other arguments for tariffs.

Throughout the argument the case was narrowly linked with an increase in population on which the author constantly focused attention. This introduces a dynamic element into the discussion. Treatment of the effects of trade on the distribution of income usually referred to given quantities of the factors of production, including Labour and this approach is still the customary one.[11] However, Brigden did not discuss the effects of trade or protection upon population growth or vice versa. He was content to assume that population pressure was there irrespective of the economic policy pursued. The introduction of an increasing population, however, leaves less scope for making definite statements about Labour's absolute share in the national income after protection, because the national income itself may have changed, with an increased population, through factors other than trade. This does not imply that nothing meaningful can be said. If, through increased pressure of population on resources (with or without trade), national income per head falls and if a tariff redistributes income to the extent that, for the factor Labour, income per head remains the same, Labour is obviously better off than it would otherwise have been even if the real income of the individual worker has not improved. This is exactly what Professor Brigden thought had been achieved in Australia.

10. *The Australian Tariff—An Economic Enquiry.* (Melbourne University Press, 1929.) This is the report that has been referred to already. It was written by J. B. Brigden, D. B. Copland, E. C. Dyason, L. F. Giblin and C. H. Wickens.

11. Compare for example Stolper and Samuelson: "Protection and Real Wages", *Review of Economic Studies*, November 1941. Their so-called box diagram implies fixed quantities of the factors of production.

Although not always unambiguous, it would seem that Brigden's complete case in defending Australian protection up to 1925 can be summarized as follows:

Australian natural resources of all kinds were unable to support an increase in population at the same income per head. This applies equally under protection and under free trade.[12] Free trade would have done two things:

(1) It would have forced the increasing population into agricultural production under diminishing returns.

(2) It would have worsened Australia's terms of trade with the rest of the world.

These two influences are called the "cost" of free trade. Protection, on the other hand, involves the "cost" of having to forgo the lower cost of imports. This is offset, however, by the avoidance of production under diminishing returns and by the avoidance of a worsening of the terms of trade.

Lastly, in spite of an increase in population, the standard of living of the wage earner has been maintained at the expense of landowners who under free trade would have had higher incomes.[13]

It is not quite clear what Brigden thought had really happened to the incomes of landowners. If real income increases less than in proportion to the population increase, average real income per head must have decreased somewhat. But if workers' standards of living did not change, the income per head of landowners must have decreased. Yet Brigden said that protection had "merely prevented a rise in land values". With regard to total income per head there is the suggestion that it had been higher under protection than it would have been under free trade, although still lower than in proportion to the increase in population. Protection, he says, "has imposed a reduction of income which might have been as great from a fall in export values alone and has maintained an income which certainly would have fallen through diminishing returns from land".

Brigden's original article gave rise to criticism by Benham[14] and a discussion followed in *The Economic Record*, in the statistical issues of which L. F. Giblin also took part.[15]

12. See *The Economic Record*, November 1925, p. 42.

13. In interpreting Professor Brigden in this way the author has taken the liberty of giving his frequently used term "the standard of living" the content "the standard of living of the wage earner". This seemed reasonable also in view of later developments in the discussion. It remains true, however, that Brigden's own article leaves some doubt. On p. 30 we read: "the standard of living resulting to the general mass of the community" which seems to support this interpretation. But on p. 37 is stated: "Free trade in England made for a higher standard of living . . . Protection in Australia may have achieved a similar result". This would seem to refer to "standard of living" in the more generally used sense of real income per head.

14. F. C. Benham: "The Australian Tariff and the Standard of Living; A Reply". *The Economic Record*, May 1926.

15. See *The Economic Record*, May and November 1927. Giblin's Note is in the May 1927 issue.

Benham doubted the factual assumptions, with regard to decreasing returns in Australian agriculture and with regard to the danger of worsening terms of trade, which were contained in Brigden's exposition. The controversy was partly on statistical evidence, where Giblin supported Brigden's case. In a restatement, Benham ably refuted the diminishing returns argument for protection as developed by Brigden.[16]

With regard to the effect that protection has had upon the Australian distribution of income, Benham believed that little could be said with any certainty. Although he admitted that protection had kept down the value of rural land, he did not believe that it follows that under free trade landowners would have received more and Labour less. For protection, he said, "has also kept down the value of 'labour' performed in primary production . . . and it has raised the value of city land and urban property in general". Because Benham's views would seem to be representative of the main body of economic opinion with regard to the effects of protection on the distribution of income at that time, it may be interesting to quote him in full: "Possibly Protection, coupled with wage regulation, has enabled somewhat higher 'real' wages to be paid to certain relatively unskilled workers. These may gain, as workers, more than they lose, as consumers, by the increased cost of living: although workers in general seem to the writer to suffer from Protection. Such gain as has occurred to the relatively unskilled appears to have been balanced by loss to the relatively skilled".[17]

If we compare the position of Brigden and Benham with regard to the influence of trade on the distribution of income it would seem that Brigden's proposition, that Labour had gained from Protection, although suffering from invalid theoretical support, would in the

16. See *The Economic Record*, November 1927, pp. 240-243. Briefly stated Brigden's diminishing returns argument for protection ran as follows:

Under free trade, people would have been forced into primary industry, because there would not have been a manufacturing industry of sufficient size to take care of the growing population. This would have involved the cost of having to produce under diminishing returns and would have resulted in a lower real national income per head.

Benham's objection to this argument was basically this: If protection thus provides for a higher real income per head, manufacturing industry must have been more productive than the alternative extension of primary industry would have been. However, if this is to be assumed, resources including Labour would not under free trade have moved into primary industry beyond the point where their productivity in the primary field would have been lower than in manufacturing. As soon as that point had been reached, they would have been used in manufacturing industry where their productivity, and therefore rewards, would have been higher. Because of this Benham saw no reason to assume that real national income per head would have been any lower under free trade than under protection. On the contrary, he believed, partly on grounds of efficiency, that free trade would have resulted in a higher real national income per head.

Two things may be noted here:

First, Benham's refutation does not concern possible and perhaps desired shifts in the distribution of the national income.

Secondly, presented in a different way, the diminishing returns argument for protection may be quite valid, as mentioned later in this article when Copland's contribution is discussed.

17. *The Economic Record*, May 1926, p. 39.

future come nearer the limited theoretical justification of Stolper-Samuelson than Benham's more uncertain stand. Benham, however, by stressing that Labour contains within itself different categories and by stressing the difference between rural and urban land values, loosened some of the rigid assumptions that underly the Stolper-Samuelson theory.

III

The reader of the 1929 *Australian Tariff Enquiry* will notice the resemblance of the ideas contained therein to those to be found in Brigden's 1925 article. The discussion in the *Enquiry* is more comprehensive and a statistical attempt is made to measure the cost of protection, but basically the conclusion is that the tariff in Australia was justified. The main conclusion was framed as follows: "The advantage of protection is in the maintenance of a larger population than could have been expected at the same standard of living[18] without the protective tariff. It is not an advantage to every part of the population nor has it produced the maximum income per head. But given the basic Australian objective of seeking the largest white population at the highest standard of living,[19] we consider that the protective tariff has been an effective means of securing it. The practical conclusion is that, having established this population, it would be disastrous to abandon the policy which has made it possible".[20]

In a review article on the 1929 *Tariff Enquiry*, J. Viner,[21] although basically critical of its findings, considered the *Enquiry* a significant contribution to the tariff literature. He said "no previous study has gone as far as this in exploring the relation between tariffs and the distribution of income".

IV

There is little doubt that this Australian contribution stimulated the search for theoretical support of the proposition that a large factor of production, such as Labour, will see its position improved, absolutely as well as relatively, by means of a tariff on manufactured goods in the production of which it enters heavily.

The argument for tariff protection based on the redistribution of factor income was transferred to the United States in 1931 by Professor D. B. Copland, one of the authors of the 1929 *Tariff Enquiry*.[22] In his argument, however, Copland did not base his defence of the Australian protective policy purely on these grounds. He said: "If, as seems established by the investigation, it would have cost more to extend production on the land than to have indulged in a limited application of the tariff to manufacturing industry, the latter course was economically the sounder".

18. To be interpreted in the same sense as in Brigden's article.
19. This time perhaps to be interpreted in the ordinary sense of real income per head.
20. See p. 140 of the *Enquiry*.
21. J. Viner: "The Australian Tariff". *The Economic Record*, November 1929.
22. D. B. Copland: "A Neglected Phase of Tariff Controversy". *Quarterly Journal of Economics*, February 1931.

It may be noticed that, according to Viner, all that the 1929 *Enquiry* had really tried to show was that a redistribution of income from landlords and capitalists to an increasing working population had been achieved. This desire to redistribute income was basically political and therefore not an economic argument for protection. However, both the *Enquiry* and Copland mention the increasing cost aspect of primary production and contrast this with the situation in manufacturing industry. If there are external economies associated with manufacturing, it is generally recognized that there is a possibility of a loss to a country from free trade. Under free trade such a country would specialize in accordance with individual marginal comparative cost. When there are external economies (external to the firms or industry, but internal to the nation) the social marginal cost involved in manufacturing may be lower than the private marginal cost. Yet, under free trade, production is decided on the basis of the latter. Some protection may therefore be economically justified. However, this does not imply that this type of argument received the central attention that it perhaps deserved either in the 1929 *Enquiry* or in Copland's 1931 article. To the extent that external economies can indeed be achieved, there is, in the long run, no "cost" to the nation involved in protection.[23] Yet these "cost" considerations took central place, which seems to confirm Viner's contention that the basic conclusion of the *Enquiry* was that the tariff had made possible a redistribution of income, maintaining the living standards of an increasing work force.

This view is further confirmed by Copland himself and by another member of the committee which reported in 1929. Professor Copland[24] stated: "True, on economic grounds it would be wiser to have the smaller population at a higher standard of living", and ". . . the tariff . . . is a 'method of painless extraction', and it is idle for economists to ignore such a fundamental fact".

Professor Giblin[25]—in 1936—said with regard to excess costs: "The meaning of that is that Australia as a whole is forgoing consumption goods to that value for the sake of additional population and employment" and also: "The 'benefit' is primarily an increase of population—a political end which cannot be measured in terms of economics".

V

Copland's article gave rise to further discussion of the issue of the effects of a tariff on the distribution of income. In *The Quarterly Journal of Economics*, November 1938, Karl L. Anderson dealt with some of Copland's views in an article entitled "Protection and the Historical Situation: Australia". Anderson denied the possibility of maintaining the standard of living of an increased labour force by

23. The same applies to a favourable "terms of trade effect" of the tariff which is contained in the discussion in the *Enquiry*.

24. *Op. cit.*, p. 308.

25. L. F. Giblin: "Some Economic Effects of the Australian Tariff". *The Joseph Fisher Lecture in Commerce.*

means of protection. He asserted that under free trade each of the factors of production receives its maximum income because each separate factor "seeks out its most effective place".[26]

Professor Anderson's critique gave rise to a prompt reaction in America by Marion Crawford Samuelson.[27] As her reason for wishing to examine the validity of Anderson's conclusions, Mrs. Samuelson gave that "matters of principle are involved transcending in importance the details of the Australian case, and because Professor Anderson has stated boldly and clearly a view widely held by many economists".

Mrs. Samuelson supported Anderson in his refutation of the "diminishing-returns-argument" for protection as it was presented in the Australian case. This refutation was along much the same lines as that by Benham.

She rightly criticized Anderson's refutation of the "terms of trade argument" for protection. She also took issue with Anderson on the effects of the tariff on the distribution of income. In doing so, she defended the Australian case in so far as the possibility of maintaining Labour's standard of living by means of the tariff was concerned. She pointed out that to claim, as Anderson did, that under free trade the marginal value productivity of a factor in every use is equalized, really proves nothing with regard to the absolute share of that factor. It does not imply a maximization of return to that factor. She said: "In fact, if all Australian labour were organized, it would pay them to embark on a purposive policy of discrimination designed to render unequal the remunerations in different occupations, just as it always pays a monopolist to discriminate, if he can". More important than this, she said, is the fact that by protection one can change the relative prices of the two goods, so that the new marginal value productivities (of the factor Labour) will be equalized at a level more favourable in an absolute sense to the working class.

"It is perfectly clear," said Mrs. Samuelson, "that the imposition of a prohibitive tariff on the import of raw silk into the United States would increase the rent of the owners of land suitable for the growth of mulberry trees and the earnings of workers, if there be such, completely specialized in the caring for silkworms. What is true of a narrowly defined factor of production may also be true of the broad categories of land and labour. In the Australian case, where there are more or less constant returns to labour in manufacturing, with diminishing returns in land, the above possibility must be taken very seriously."

It was in 1941 that Stolper and Samuelson took the matter further and proved that, under certain assumptions, one of two productive factors which was made relatively scarcer by a tariff must of necessity gain, not only relatively, but also absolutely. Basically, their argument was as follows:

26. *Op cit.*, p. 103.
27. See Marion Crawford Samuelson: "The Australian Case for Protection Re-examined". *The Quarterly Journal of Economics,* November 1939.

Suppose two countries, *A* and *B*, produce two commodities, wheat and watches, with two factors of production, Capital and Labour. *A* has a relative abundance of Capital, *B* of Labour. Wheat production is Capital intensive, watch production Labour intensive. A tariff is now imposed by *A* on the importation of watches. This will mean increased production in *A* of watches and both Capital and Labour in *A* will be shifted from the wheat to the watch industry. The result of this will be to reduce the proportion of Labour to Capital in both the wheat and the watch industry in *A*. As a result of this, the marginal product of Labour must be higher than before and the real wage rate must therefore have risen.

The important difference from earlier reasoning is that Stolper and Samuelson proved that under the assumed circumstances[28] Labour's absolute share must of necessity always rise, quite irrespective of whether real wages are measured in terms of watches or wheat. There is no index number problem. Neither is it necessary to assume monopoly in the Labour market. Also, Labour gains even if the real national income decreases.

Owing to the fact that their proof only applied under rigid assumptions—for example it applied strictly only where no more than two factors of production are involved—Stolper and Samuelson were very cautious with regard to a practical application of their theory. They said: "Thus, in Australia, where land may *perhaps* be said to be abundant relative to labour, protection *might possibly* raise the real income of labour" (my italics).

VI

The contribution by Stolper and Samuelson was generally considered to be a great improvement in the theory of tariffs. But as Metzler pointed out,[29] a number of questions still remained unanswered.

Stolper and Samuelson developed their theory under the assumption "that the country in question is relatively small and has no influence on the terms of trade". Although Brigden and Copland expressly assumed an unfavourable effect on the terms of trade from a removal of the tariff, the pure terms of trade argument for protection has, so far, been kept outside our discussion. Metzler, however, stresses that whether a tariff increases or reduces the relative returns of the scarce factor is not independent of what happens to the terms of trade. Whether Labour (if the relatively scarce factor) sees its real and relative returns increased or decreased by the tariff depends, according to Metzler, upon the magnitude of the favourable movement in the terms of trade, compared with the size of the tariff.[30]

What role, then can the terms of trade play?

28. Which include full employment of the two given factors.

29. Lloyd A. Metzler: "Tariffs, the Terms of Trade, and the Distribution of National Income". *The Journal of Political Economy*, February 1949.

30. Compare also J. E. Meade: *Trade and Welfare*, Ch. XVIII in his discussion of the "abnormal case".

Normally the tariff will increase the prices of import-competing goods, relative to the prices of export goods, within the country. This will attract more of the scarce factors into the import-competing industries, and in this case the Stolper-Samuelson conclusions stand. This relative increase of the prices of import-competing goods will always occur if the foreign demand for the products of the country is elastic. This can be shown with the use of the Mill-Marshall schedules of reciprocal demand which Metzler uses throughout. Also, if the tariffs do not reduce the demand for imports at home to any substantial degree, the movement of world prices is likely to be negligible. However, says Metzler, if the world demand for the tariff-imposing country's exports is inelastic and if the tariffs do reduce the demand for imports in the tariff-imposing country to a considerable extent, the fall in world prices of imports, relative to world prices of exports, may be so large that domestic prices of imports become lower, in relation to export prices, than before the tariffs were imposed, even after the tariffs are added to the world prices.

The main purpose of Metzler's contribution was to find out under what circumstances tariffs, because of their effect on the terms of trade, reduce the domestic ratio of the prices of import goods and export goods. Such a result would mean that the Stolper-Samuelson income distribution effect goes into reverse. This would be most important in view of the previous discussion. Metzler first set out to find the exact conditions which would result in no change at all in the domestic price ratio between import prices (inclusive of the tariff) and export prices. This, according to Metzler, will be the case when the elasticity of foreign demand for the country's exports is exactly equal to the proportion of tariff proceeds *not* spent on imports.[31] If, in other words, the sum of

31. If η_2 is the elasticity of foreign demand for the country's exports and k its marginal propensity to import we have what Metzler calls the "intermediate case" if $\eta_2 = 1 - k$. Metzler proves this proposition with the help of the Mill-Marshall type of diagram, assuming two countries Alpha and Beta trading in two commodities, wheat and textiles, under the assumption that Beta's reciprocal demand for wheat is inelastic. Alpha, imposing a tariff, improves its terms of trade and now has to give less wheat in exchange for more textiles. The extra gains from trade take the form of tariff revenue, a fraction k of which is again spent on imported textiles and the rest on no longer exported wheat. For the relative prices in the taxing country to be unaffected by the tariff, the additional demand for textiles must match the additional supply. It is sufficient to concentrate on one of the two commodities because reciprocal demand schedules present both a demand for one commodity and a supply of the other. Equilibrium in the one market therefore implies equilibrium in the other. If we now take τ to be the tariff, as a percentage, then $k\tau$ was spent on imports and the remainder, or $(1 - k)\tau$ was spent on wheat formerly exported. The additional demand for textiles is therefore $k\tau$. The additional supply of textiles may be derived from the additional wheat consumption in Alpha if we introduce β, the (negative) elasticity of Beta's reciprocal demand. This additional supply is then β times the additional wheat consumption in Alpha. We have therefore that $k\tau$ must be equal to $-(1 - k)\tau\beta$ (where β is negative). For this we may write $k = -(1 - k)\beta$. But we can translate β into η_2, which is the elasticity of the ordinary money demand of Beta for Alpha's exports of wheat, according to the formula $\beta = 1 - 1/\eta_2$. This formula Metzler derives in his footnote 21 as follows: "Let t equal the quantity of textiles that Beta is willing to export, and let w represent that country's demand for imported wheat. The elasticity β of the reciprocal demand schedule is then $\frac{dt}{dw} \cdot wt$. But the quantity t, from one point of view, is simply the

the foreign elasticity of the demand for our exports and our marginal propensity to import equals one, there is no incentive for the Labour-intensive import-competing industry to attract more relatively scarce Labour and the domestic distribution of income is therefore not affected. However, should this sum be smaller than one, then tariffs, so far from bettering the position of the relatively scarce factor, will reduce its income.[32]

Metzler discussed the practical consequences of the results in some detail with special reference to the Australian case,[33] and pointed out the inconsistency of using, at the same time, the terms of trade argument and the redistribution of income argument (i.e. the less elastic the foreign demand for wheat and wool, the greater the possibility that the tariff will actually redistribute income at the expense of Labour).

In Metzler's own words "Paradoxical as it seems, the Australian manufacturing industries might be better 'protected' and receive more encouragement under free trade than under a system of protective tariffs".

The question arises whether Metzler's conclusions can be reconciled with the opinion of Heckscher and Ohlin that international trade always increases the demand for a country's relatively abundant factors.

Metzler himself thinks that his conclusions are essentially consistent with the views of Heckscher and Ohlin. The latter economists, according to Metzler, compare a state of trade with a state of no trade at all, whereas he compares trade with tariffs with a system of trade under smaller tariffs. In other words, Metzler points out that his argument is only valid for a certain range of tariff changes for which

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total outlay of Beta for imports, w. In money terms, in other words, $t = pw$, where p is the import price of wheat. β may therefore be written $\beta = d(pw)/dw \cdot w/pw$. Upon simplifying and carrying out the indicated differentiation, this becomes $\beta = 1 + dp/dw \ (w/p) = 1 - 1/\eta$, the elasticity, η, being defined now in the Marshallian sense". We now have the following value for k: $k = -(1 - k) \ (1 - 1/\eta_2)$. This yields $\eta_2 = 1 - k$. If this condition is fulfilled the internal ratio between import prices (inclusive of the tariff) and export prices is unaltered by the tariff.

32. In arriving at these conclusions Metzler made use of A. P. Lerner's exposition in 1936. See A. P. Lerner: "The Symmetry between Import and Export Taxes", *Economica* New Series, Vol. 3, 1936. In an article called: "Tariffs, International Demand, and Domestic Prices", *Journal of Political Economy*, August 1949, Metzler further refined his formula. In order that the domestic ratio between import and export prices be undisturbed, the following more exact conditions must be satisfied, conditions which differ according to how the customs revenues are spent. The exact condition when customs revenues are entirely spent by the government becomes $\eta_2 = 1 - k \left(\frac{1+\tau}{1+k\tau}\right)$. When tariff proceeds are entirely spent by private traders, the exact condition becomes $\eta_2 = 1 - k \left(\frac{1}{1+(1-k)\tau}\right)$. The original approximate formula, which required that $\eta_2 = 1 - k$, is intermediate between these two exact conditions. This means that in the case where duties are largely spent by private traders η_2 will normally have to be somewhat larger. But, says Metzler, "considering the crudeness of most empirical estimates of demand elasticities, and considering, further, the difficulties in defining schedules of reciprocal demand rigorously, the approximation . . . is probably satisfactory for most practical purposes".

33. *The Journal of Political Economy*, February 1949, pp. 20-22.

the foreign demand for the country's exports has a certain degree of inelasticity. As tariffs move towards the level where they cut off all trade, sooner or later the foreign demand for one's exports must become elastic.

Metzler's revision of the Stolper-Samuelson principle, taking into account the effects on the terms of trade, was elaborated by A. Y. C. Koo in 1953.[34] Koo took matters further and followed up a suggestion made by Metzler, that the case where there are duty imports as well as non-duty imports should be investigated. He pointed out that the Stolper-Samuelson theory, even as revised by Metzler, still rests on the implicit assumption that imports consist of only one imported commodity to which the tariff applies. In other words, it is basically a two-commodity-approach. By introducing three commodities, two import-competing goods, one dutiable and one duty free, and the third an exportable commodity, Koo shows that the theory needs to be further amended. The Stolper-Samuelson-cum-Metzler results, he says, imply the assumption that in the duty-imposing country the domestic price of duty imports, including the tariff, must move in the same direction as the domestic price of non-duty imports. It is therefore important to know how the price of non-duty imports reacts to the tariff. Only this, combined with knowledge about the relative use of a country's scarce factor of production within the duty domestic industry—as compared with the non-duty domestic industry—will make it possible to determine the effect of a tariff on the domestic distribution of income.

VII

Recently, the Stolper-Samuelson theorem was criticized in an article by K. Lancaster.[35]

Lancaster says that the Stolper-Samuelson theory as formulated does not make allowance for demand factors. His line of reasoning is as follows. Relative scarcity or abundance of factors of production is not merely a matter of physical endowment of those factors compared between countries. Countries may be of equal size and possess equal amounts of Capital and Labour and yet differences in their demand for Labour-intensive and Capital-intensive goods may make Labour the "scarce" factor in one country and Capital the "scarce" factor in the other. Quantitative differences in availability of factors do therefore not guarantee that under free trade those goods will be imported which use a larger proportion of the physically relatively "scarce" factor of production. On these grounds Lancaster suggests that the Stolper-Samuelson theorem be reformulated. Instead of "Protection raises the real wage of the scarce factor" he suggests "Protection raises the real wage of the factor which in the imported good is relatively more inten-

34. A. Y. C. Koo: "Duty and Non-Duty Imports and Income Distribution". *American Economic Review*, March 1953.

35. K. Lancaster: "Protection and Real Wages. A Restatement". *The Economic Journal*, June 1957.

sive". He says: "Protection will raise the real wage of labour if, and only if, the country imports the labour intensive good".

Although Stolper and Samuelson could perhaps have been somewhat more explicit on this point, I myself have never felt that relative "scarcity" of the factors "in the Stolper-Samuelson sense" was relative scarcity in the sense of physical endowment regardless of demand conditions. In the first place, Stolper and Samuelson based their discussion on the theory developed by Heckscher and Ohlin, which they took further. Ohlin did by no means ignore the influence of demand[36] but believed differences in endowment to be the more important factor in trade.[37] Stolper and Samuelson seem to share this belief. Although they may perhaps be accused of not explicitly mentioning the influence of demand, implicitly their scarcity criterion is based on the direction of trade which automatically incorporates demand influences. They say: "The introduction of trade will shift production in the direction of the good with 'comparative advantage'. According to the Ohlin analysis . . . this will be wheat which uses much of the abundant factor". Dr. Lancaster has drawn attention to the possibility of confusion through loose phrasing. However, there is little evidence in the literature that misunderstanding has occurred.[38]

VIII

Having outlined the theoretical developments with regard to trade and the distribution of income, we may now turn to the problem of how relevant the theory is to protection in Australia.

The first question we may consider is whether in Australia the terms of trade effect is likely to have reversed a possible redistribution of income effect of the protective tariff, a result which Metzler himself considered quite possible. It is generally considered unlikely that on the import side Australia is important enough in the world market to be able to reduce world prices of its import goods to any appreciable

36. The following quotations from his book *Interregional and International Trade* may illustrate this:

Page 37: ". . . the uneven distribution of productive factors will, ***unless it is balanced by a corresponding unevenness in demand,*** tend to make the factor prices different in the various regions, and thereby bring about a certain division of labour and trade between them".

Page 39: A real explanation (of differences in costs of the factors of production) ". . . entails a study of the basic data of price formation, above all the relative abundance and scantiness of the endowment with the various factors in each region, ***and as a rule also the conditions of demand***" (both quotations my italics).

37. Ohlin: *op. cit.*, p. 40: "The great inequality as regards factor equipment in the case of no trade means an enormous loss; for it is not balanced by a corresponding inequality in demand".

38. Compare for example Metzler in *The Journal of Political Economy*, February 1949, page 8: ". . . the scarce factor of production, i.e. the factor relatively most important in the industries competing with imports" and again, page 10: ". . . the scarce factors of production—those required in relatively large amounts in the import industries . . .".

extent by means of a tariff.[39] The opinion is also widespread that on the export side there are bound to be important terms of trade effects of a tariff in view of an inelastic demand for Australia's exports.

We have seen that Metzler reduced the problem of whether a tariff will cause a terms of trade effect to offset a Stolper-Samuelson redistribution effect to a simple formula. In the Australian case it could not cause this if the sum of the Australian marginal propensity to import and the foreign elasticity of demand for Australian exports equals or exceeds one. Clark and Crawford[40] estimated the marginal propensity to import to have been 0·21 in the 'twenties and 0·25 in the 'thirties. Whether the Stolper-Samuelson theory stands in the Australian case for the inter-war period would therefore seem to depend on whether the foreign elasticity of demand for Australian exports has been less than 0·75.

Although the elasticity concerned is quantitatively unknown, this does not mean that nothing can be said. Tariff policy with the aim of protecting manufacturing industry is basically a long-run policy and underlying Metzler's theory are the basic assumptions of internal and external equilibrium, i.e. full employment and balanced trade. Whereas it may perhaps be assumed that the short-run elasticities of world demand for Australian export products are low, this does not apply in the long run. If Australia should gradually protect more and more manufacturing industries and thus gradually attract resources away from primary production for export, this effect on world supplies has plenty of time to call forth adjustment. Marginal producers abroad would be drawn in, which results in a high (long-run) elasticity of foreign demand for Australia's exports. It is theoretically correct that a sudden increase in the overall level of tariffs could cause a considerable short-term improvement in the terms of trade, should the short-run elasticity of demand be very low. This could temporarily reverse an income redistribution effect. In practice such sudden increases are usually the result of emergency situations. The drastic increase in protection in 1929/30, for example, occurred during a period of unemployment and unbalanced trade. In spite of the tariff Australia's terms of trade became less favourable because the world depression had caused a relatively heavy downward shift in the world's demand schedule for Australia's exports.

If we turn from the past to the future, the question is whether a return to free trade is likely to worsen Australia's terms of trade to such an extent that such a policy, instead of hurting the factor Labour, improves its relative as well as absolute position, assuming that Labour is the factor that enters relatively most heavily into the

39. Compare for example W. M. Corden: "The Calculation of the Cost of Protection", *The Economic Record*, April 1957, p. 47: ". . . the import component of the terms of trade effect can be neglected". The fact, however, that in the past Britain, receiving imperial preference, has been Australia's major trade partner allows perhaps for some influence of the tariff on prices quoted by Britain.

40. Clark and Crawford: *The National Income of Australia*, Ch. XI, section IV.

production of import-competing goods. This would again require a low elasticity of foreign demand for the products of Australian soil. But once more, from a practical point of view, a return to free trade could only be a very gradual process so that overseas supplies of wool, wheat, etc., would have plenty of time to adjust themselves. All over the world marginal producers of such commodities would gradually drop out. The long-run elasticity of foreign demand would again be much higher than the short-run elasticity.

I believe, on the basis of these practical considerations, that Australian protection cannot have had the effect of improving the Australian terms of trade sufficiently to reverse a possible income redistribution effect. There is no evidence to support such an outcome and workers have kept on drifting to the cities.[41] The belief that the terms of trade effect cannot have offset a possible redistribution of income effect of the tariff does not imply a belief that there has been no favourable movement in the terms of trade. As long as foreign reciprocal demand is less than perfectly elastic, tariffs can improve the terms of trade, provided that there is no retaliation.[42] In this connection it is perhaps interesting to point out that if foreign reciprocal demand is elastic, a tariff will improve the terms of trade of the tariff-imposing country more if its own reciprocal demand is also elastic. A low elasticity of supply by Australia of the primary products that it exports, making for a less elastic Australian reciprocal demand, would then put the brakes on a favourable movement in the terms of trade.

The terms of trade effect of a tariff was discussed only because of the possibility of a clash between this effect and the Stolper-Samuelson redistribution effect. If it may be assumed—as I think it should—that such a clash is ruled out under Australian conditions, we must conclude that formally, in the Australian case, the Stolper-Samuelson theory is still applicable.[43] It is important to realize, however, that many simplifying assumptions underly this theory as originally presented, assumptions which were the same as those associated with the Heckscher-Ohlin theory. At the same time, as the authors themselves suggested, if interest is centred upon what happens in one country only, the redistribution effect of trade can to some extent be divorced from the Heckscher-Ohlin theorem. As Metzler has put it: "... *any* event, other than a change in technology, which leads to a shift in resources from one industry to another will increase both the real income and the relative income of the factor required in relatively

41. Such negative evidence however could be misleading. Monopolistic power of trade unions and progressive taxation could have made work in the cities more profitable. There is also the attraction of urban life.

42. Although this is perhaps not to be classified as "retaliation" attention may be drawn to the increasing agricultural protection in predominantly manufacturing countries particularly since the 'thirties.

43. The more realistic assumption of elastic foreign demand in the long run makes it unnecessary for our present purpose to enquire into the nature and price behaviour of non-duty imports since Koo's considerations can only reduce the possibility of a clash.

large amounts in the expanding industry''.[44] In the Australian case we would therefore have to show that protection has shifted resources from primary into secondary industry and that Labour was required in relatively large amounts in the latter industry.

If we could assume that in the past Land and Labour were by far the most important factors of production and that a simple distinction could be made between primary production consisting mainly of export goods and secondary production being mainly in the import-competing field, the latter being also far more Labour-intensive, we would seem to be justified in concluding that there must have been a shift in income distribution in favour of Labour. Although this may perhaps seem a reasonable enough description of Australian conditions when protection was first applied we should not forget that Metzler's statement can only be given rigid content when there are not more than two factors of production involved. Even in the early days of protection we cannot overlook the factor Capital. Should Capital have been required, in the protected industries, in relatively even larger amounts than Labour, but both large compared with Land, Capital would have profited even more from the Tariff than Labour, both at the expense of Land.[45]

It is obvious then, that if we introduce more than one factor of production, our footing becomes less certain[46] and it is tempting to investigate to what extent the Stolper-Samuelson theory has retained practical applicability under actual conditions in Australia since protection became an established policy. But it would seem more profitable under Australian circumstances to direct attention to two other assumptions that underly the analysis, namely unchanged technology and unchanged total amounts of the factors of production. These assumptions clearly illustrate that the analysis is purely a static one. However, it must be seriously doubted whether a static analysis is at all relevant to the tariff problem in Australia. In the short run a sudden increase in protection may well cause a redistribution of income although the effect may be difficult to disentangle from, for example, the effect of a world depression. But if we look upon Australian tariff policy as a long-run policy with the aim of gradually developing its secondary industry, our static model becomes irrelevant. Since protection the country has been in the process of increasingly rapid

44. *Journal of Political Economy,* Feb. 1949, p. 18. My italics.

45. This does not rule out a redistribution of such capitalist gains to Labour by other means such as taxation. Here we are only concerned with a redistribution effect of trade protection.

46. Stolper and Samuelson stressed this themselves. They say: "However, we must admit that three or more factors of production within a single country do seriously modify the inevitability of our conclusions. It is not only that the relatively scarce factor can be defined only circularly as the one whose price falls most after trade, but even if we do know the behaviour of relative factor prices, i.e. relative shares in the national income, it seems that we cannot infer unambiguously that the physical marginal productivities move in the same direction. Even though these continue to depend only upon the proportions of the factors in the respective industry, diverse patterns of complementarity and competitiveness emerge as possibilities".

economic development. The population has increased, production techniques in the fields of primary and other production have improved, capital has become more important in primary industry as well as manufacturing, and standards of living have risen in all sections of the community. In the long run redistribution of income as caused by a Tariff should not be regarded as a shift in personal incomes. Even if the Tariff should make farming less profitable and cause existing farmers a capital loss this will not affect the income of new entrants into the occupation. The latter will only enter farming if, on the basis of the lower land values, they can make as good a living on the land as elsewhere. In a growing economy even actual capital losses are not likely and all that can be expected is that additional capital and labour resources are relatively more attracted by other than primary production. As a percentage of total national income, farm income will fall, but individual farm income keeps in step with the prevailing standard of living. The tariff has tried to direct economic growth largely in the direction of manufacturing. If tariff policy is to be judged, it has to be on its success or otherwise in achieving this and on whether the encouragement of manufacturing has been an important stimulus to economic growth, resulting ultimately in higher real income per head.

The classical theory of comparative cost which supported the free trade doctrine was formally correct on its assumptions, which included high elasticities of demand and supply, pure competition and full employment. But it could never handle the infant industry argument for protection because this implied the dynamic factor of economic growth. If in Australia the encouragement of manufacture has stimulated economic growth and yielded external economies to its industries we have a dynamic argument for the tariff. This, I believe, the tariff has done. To link with such a policy essentially static income redistribution effects can easily lead to confusion as is evident from the literature on the Australian case in the 'twenties. I feel that more can be gained by regarding the Australian policy of protection in the past as an instrument for stimulating economic growth.

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ECONOMIC EXPERIMENTS IN NEW ZEALAND AND THEIR POLITICAL BACKGROUND

It happens very often that events catch up with the historian of contemporary developments. Sympathy rather than criticism seems to be called for in such cases. However, in his study of *Economic Experiments in New Zeland*,[1] Professor Condliffe presents a thesis which would appear to need amendment even if the march of political events in that country had not put a new complexion on the subject.

Professor Condliffe's study celebrated the election defeat in 1949 of a Labor Government which had been in office for 14 years. It was published last December in the same month that New Zealand voters reversed the process: after eight years in opposition the Labor Party (with a very slender majority) is in power again.

So far as Condliffe's article is concerned this would not matter very much if there were no doubt about his conclusions. As things are, however, there appears to be a danger that the reader who has no special knowledge of the case will mistakenly apply some of these conclusions not only to the interpretation of events up to 1949 but also to the evaluation of the policy of the present government of New Zealand. In particular, he might infer that New Zealanders who are said to have "rejected the further extension of intervention based on socialist principles"[2] in 1949, have now reversed that decision.

In fact the voters heard a great deal about "free enterprise versus socialism" from the National Party in both election campaigns; but the records of the two parties which in turn have ruled the country since 1945, and the circumstances of their election defeats, suggest that the issue of socialism had very little substance. The real issues were, I believe, the growing conservatism and comparatively austere financial policy of the Labor Government up to 1949; and, in 1957, its election platform based on tax remission plus old-fashioned protectionism. Apart from that, the label of doctrinaire socialism as applied to the New Zealand Labor Party does not check with the record—any more than the same label applied by Republicans to American Democrats. In New Zealand both parties when in power have used the same policy instruments on the same *ad hoc* basis to regulate economic activity, and if one is to be labelled socialist then there is a good case for applying the same label to the other.

What Professor Condliffe has done would be easy enough to understand if he had not, before becoming a distinguished American professor of economics, been the most eminent of economic historians in New Zealand. His main work in this field has enhanced the vigorous and scholarly tradition established by Pember Reeves, Scholefield, and

1. *American Economic Review*, December 1957, p. 930 ff.
2. *Ibid.*, p. 944.

others.[3] In his new article he appears to apply preconceptions formed in the nineteen thirties to post-war developments.

1. *The Background*

In an admirable sketch of the background and performance of New Zealand's Labor Government from 1935 to 1945, Condliffe's latest article makes it clear that socialist doctrines expounded in earlier years when Labor was in opposition were not the basis of its policy as government. "The land was not socialized, nor farm nor factory production, nor banking";[4] the socialist left wing of the party was all but wiped out, its leader, John A. Lee, first losing his ministerial office, then his seat in parliament, and finally his membership of the party.

Yet it does not emerge in Condliffe's account that the "economic experiments" amounted to no more than a full employment programme, strongly flavoured by New Zealand traditions, and at least as innocent of socialist aims as Keynes's *General Theory*. There was a new deal for farmers, similar in principle to the American price support programme but more conservative in that it turned out to be self-financing. Wage earners also had a new deal, and there was an expansion and modernization of public utilities and a comprehensive social security scheme. These changes appeared to have an adequate economic basis because of an increase in the volume of exports and an improvement in the terms of trade. (Exports then amounted to over a third of national income.) Full employment, in both Keynes's and Beveridge's interpretations of the term, was established in about three years. However, some of the measures adopted to deal with unemployment[5] proved to be redundant, and a longer term effect has been a labour shortage which has persisted up to the present day.[6] The absorbtion of the unemployed, and accelerated mechanization, resulted in an expansion of production at a rate closely approaching the rate of monetary expansion.

Exchange control and quantitative controls of imports were adopted in 1938 in the face of a balance-of-payments crisis. There is little evidence of the over-importation to which Condliffe refers as a cause of this crisis: it can be explained entirely by capital movements. Substantial short term balances had been held in New Zealand in anticipation that the Government would carry out its expressed intention of restoring the New Zealand pound to parity with the pound sterling.[7] By this time it was evident that such a revaluation was

3. Condliffe, *New Zealand in the Making*, 1930; W. Pember Reeves, *State Experiments in Australia and New Zealand*, 1902; G. H. Scholefield, *New Zealand in Evolution*, 1908; W. P. Morrell, *New Zealand*, 1935.

4. *A.E.R.* article, p. 931.

5. Unemployment was running at about 10 per cent of the labour force in 1935-36.

6. The low birth rate of the early 'thirties and aging of the post-1918 stream of immigrants resulted in a decline in number of people of working age as a proportion of total population in the 'forties and up to a few years ago. This trend has now been reversed because of the rise in the birth rate and the high rate of post-war immigration. The falling average age of the population may have significant political and economic implications for the 'sixties.

7. Cf. *Economic Record*, 1939, New Zealand Supplement, especially articles by Condliffe, Belshaw and Sutch.

inconsistent with other (short run) policy aims. Consequently, encouraged perhaps by fear of inflation, speculators pulled out.[8]

In war-time these controls of foreign transactions were supplemented by price control, credit restrictions, and a comprehensive system for the control of manpower and other scarce resources. After the war, although the Labor Government had made some progress with the dismantling of war time controls by 1949 and the National Government carried the process somewhat further, the power to regulate imports and foreign exchange dealings has been retained. It has been used by each of the successive governments both to protect local industry and to deal with balance-of-payments difficulties. This, and the direction of monetary policy after the war, were Condliffe's main concerns.

2. *Post-war Developments*

Considered as the beginning of an epoch, the years 1945-49 in New Zealand's economic experience have quite a different complexion from that which they take on in Condliffe's account—where they are treated as the end of an epoch. They were, indeed, years of reconversion initiating a continuum of post-war experience. The fact that they were also the concluding years of a 14-year period of Labor rule appears now to have little economic significance.

Condliffe treats this period as a testing time for a long-term Labor policy which concluded with its rejection by New Zealand voters. He defines the policy as one of "intervention based on socialist principles" and says that it had "the ultimate goal of socialization based on monetary expansion". However, a close study of what happened in the context I have suggested reveals that this was a period of reconstruction in which war-time emergency regulations were relaxed and some progress was made towards working out a policy of economic development. For better or for worse a policy of gradual reconversion was decided upon and this policy, initiated by the Labor Government, was continued by its successors.

Conditions peculiar to New Zealand in this period can be explained partly by the degree of effectiveness of war-time wage and price stabilization. The idea of "total mobilization" was taken literally by New Zealanders, and this is reflected in the fighting record of their troops. On the economic front, stabilization of wages and prices, associated with the deferment of maintenance and development expenditures,[9] enabled Britain to secure a major part of the imported requirements of some foods at a fraction of the price paid for com-

8. See Reserve Bank of New Zealand publication, *Foreign Exchange*, May 1952, esp. p. 28. As stated here, no official figures or estimates for the outflow of capital in the years 1935 to 1938 are available but unofficial estimates place the figure at approximately £20,000,000. This was just about the amount of the deficiency of overseas reserves of the banking system at the end of 1938 (compared with 1936 and 1937).

9. Both in the public and private sectors (and particularly in the field of local body expenditure) where the expenditures in question would not have been expected to contribute to the war effort.

parable goods from alternative sources.[10] Restriction of imports also implied short term lending to Britain, and by the end of the war New Zealand's long-term foreign indebtedness was almost balanced by short-term credits in the form of accumulated sterling balances. Of course high taxation and public borrowing contributed to these effects.

In New Zealand (as elsewhere) there was a lot of talk about "winning the peace" by methods similar to those applied to war. But war-time borrowing by the Government, deferred maintenance and development expenditures, and the whole rationing system, were explicitly expedients of war which had a measure of effectiveness only because people were assured of a return, both as consumers and producers, to conditions of relative freedom. Voluntary acceptance of a considerable deterioration of the terms of trade, and a wholesale deferment of demand, go some way towards explaining difficulties of economic policy in the immediate post-war period.

Still, in New Zealand as in Britain, many problems which might ordinarily be expected to solve themselves through the interplay of market forces remained political problems. There had been little devolution of authority from ministerial level and there was no comprehensive research or administrative system for economic planning. Decisions which might, under different conditions, have been settled between buyer and seller, often had to be referred to a cabinet minister or even to parliament. As Condliffe suggests, the burden of government under such conditions must tend to become intolerable. Apart from that, a great deal of entrepreneurial effort was diverted to the political arena: political pressure could pay better dividends than enterprise in production.

Under the Labor Government there was some loosening of the controls which produced this state of affairs, and this process went further in the eight years of (nominally) conservative government which followed Labor's defeat. The National Government cannot be said to have reversed an "extension of intervention based on socialist principles". It continued, somewhat haltingly, the relaxation of controls, but it failed to move decisively in the direction of establishing conditions in which market forces could function effectively in their place.

3. *Monetary Experience*

A long tradition of government intervention in the New Zealand economy began with planned settlement in the early colonial days. It was sustained through the experience of public works development and planned immigration under the Vogel Government in the eighteen-seventies, and gathered strength in the 'nineties when the Liberals under Seddon carried through their land, labour, and "welfare" legislation.[11] Labor built on this tradition in the latter nineteen-thirties,

10. Compare, for instance, costs and quantities of butter, cheese and meat imported into Britain from New Zealand and alternative sources (including the United States, in which case cheese is a comparable product).—British Board of Trade, Monthly Reports.

11. Condliffe, *New Zealand in the Making*, gives an excellent account of all these developments. See also W. Pember Reeves, *op. cit.*

and the post-war National Government showed no sign of abandoning it.

However, the extent and persistence of economic regulation since the war and the exercise of ministerial discretion in administering it, are not fully explained by tradition. Constantly reinforced inflationary pressures have had greater immediate importance. Deferred demands and excess liquidity left over from the war economy could possibly have worked themselves out if either of the two post-war governments had "taken off the lid" and allowed the market to establish a new price structure and a new system of input-output relations after a period of open inflation. Neither was inclined to take the risk, and as long as the economy remained excessively liquid, the retention of some direct controls was the only alternative.

Inflationary pressures and policies designed to suppress the symptoms of inflation must have an important place in any explanation of contemporary economic experience in New Zealand. They partly explain the halting progress of both governments towards decontrol and the recurrent backsliding (with the reimposition of some controls previously relaxed) more particularly when balance-of-payments difficulties arose. At the same time, there has been a tendency among New Zealanders to regard the Prime Minister and Cabinet rather as chairman and directors of a board of management and to hold them responsible for the broad lines of production policy and the distribution of income. This tendency owes more to long tradition than the first Labor Government; and the National Government left the tradition intact.

The progress of inflation over the last four years of Labor rule and the first four under the National Government is indicated by the following table, in which the monetary expansion shown is to be related to a steady increase in the volume of output at a rate slightly under 5 per cent per annum:

Net National Income at Factor Cost, Aggregate Transactions, Money Supply, and Liquidity Ratios, 1946 to 1953

	1946 £m	1947 £m	1948 £m	1949 £m	1950 £m	1951 £m	1952 £m	1953 £m
Income[12]	367·3	412·4	421·1	481·9	611·1	624·2	656·2	733·3
Transactions[13]	36·7	45·4	48·9	51·5	63·4	78·7	80·5	84·0
Money supply[14]	180·4	187·4	210·0	213·5	247·0	291·0	277·6	273·1
Liquidity ratio[15]	4·9	4·1	4·3	4·1	3·9	4·6	3·4	3·3

12. Official estimates, New Zealand Government *Year Book*, 1957.

13. Average for the year of weekly debits against demand deposits at banks. Reserve Bank *Bulletin*, monthly, Wellington.

14. Notes and coin in circulation and demand deposits at banks at the end of March in each year. Reserve Bank *Bulletin*.

15. i.e. balances held per unit of transactions settled. (In 1953, approximately £3·3 was held for every £1 per week debited from current accounts.) See *Report of the Royal Commission on Monetary, Banking and Credit Systems*, 1956, p. 467, for an index of velocity based on greater information. See also J. J. Polak, "Monetary Analysis of Income Formation and Payments Problems", *I.M.F. Staff Papers*, November 1957. My liquidity ratio varies inversely with transactions velocity. Polak uses income velocity which, in this period, increased at a lower rate than transactions velocity.

Analysis of the increase of the money supply carried out by the Reserve Bank for the period 1939-1950 showed that (a) the balance of external transactions, (b) Government transactions, and (c) the expansion of trading bank advances, contributed almost equal shares to the increase in overall liquidity. In the period covered by my figures, deficit financing by the Government had virtually disappeared as a contributory cause, and a falling trend of liquidity preference had become important.[16] Tax revenue plus public borrowing showed a surplus over public expenditure in the last four years of the Labor Government, and the National Government maintained a similar surplus up to its last two years in office, so that the indebtedness of the Government to the banking system was reduced. Expansion of bank credit and (up to the recession after Korea) surpluses on account of external trade, maintained a high level of personal and institutional liquidity in spite of the disappearance of deficit financing of a type which directly increases the aggregate supply of liquid funds.

Subsequently, until a "credit squeeze" was applied in earnest in 1956, increasing bank advances on private account became relatively more important, particularly after Korea when annual surpluses on account of overseas trade tended to disappear. A high level of liquidity in the economy remained a constant source of actual and potential further inflation, the ratio of liquid balances to transactions having fallen by 1955 to 2·9, compared with a 1938 ratio of 2·55.[17]

Prices and wages rose slowly during the four post-war years of Labor Government. Condliffe writes of conditions in this period as "deteriorating into a leap-frogging competition among farmers, merchants, manufacturers, and trade unionists for higher prices and wages". In fact, this "leap-frogging" did not really get under way until the National Government was settled in office. This is shown by the following table:

Wages and Prices: Indexes for Period 1946-1957

(Base: 1955 = 100)[18]

	Wage rates	*Retail prices*	*Wholesale prices*	*Import prices*	*Export prices*
1946	56·3	62·3	62·3	70	47·7
1947	58·5	64·3	64·6	83	60·0
1948	62·4	69·4	72·0	85	66·6
1949	65·9	70·6	71·5	77	64·4
1950	70·5	74·6	77·9	84	91·0
1951	80·1	82·8	90·7	99	106·8
1952	84·2	89·2	100·8	108	85·9
1953	89·7	93·3	99·8	102	95·5
1954	96·6	97·6	98·9	100	98·5
1955	100·0	100·0	100·0	100	100·0
1956	101·9	103·5	103·8	102	97·5
1957[19]	106·4	105·6	106·3	108	99·0

16. Cf. Royal Commission's Report, p. 456 ff.

17. As defined for the purposes of the following table. This ratio was highly stable over the years 1934-40.

18. N.Z. *Monthly Abstract of Statistics*, October 1957.

19. For part of year. (November *Abstract* shows that quarterly indexes all rose slightly over first three quarters of year.)

Up to 1955 provision for general price control by a Government-appointed tribunal was maintained, decontrol having progressed since 1947-48 by the making of specific exemptions. In 1955 general price control was formally dropped as a function of the tribunal; although its powers ("to fix, in such manner as it thinks fit, actual, minimum, or maximum price for any goods sold . . .'"[20]) remained unchanged, they were to be applied to specified goods only, not to goods in general with specified exemptions. The following year the power of exempting goods from price control was transferred from the tribunal to the Minister of Industries and Commerce. The range of goods subject to price control had been substantially reduced. Meantime import and exchange controls had been considerably relaxed in practice, though the Government still had power to proceed to any length; and each step towards the freeing of external trade from direct controls was generally followed by at least half a step back because of balance-of-payment difficulties.

The Reserve Bank, under the National Government, was attempting to make the remaining direct controls redundant by developing effective means of controlling credit. Cheap money had been Labor policy and the National Government also resisted pressure to allow interest rates to rise. This pressure increased from 1952 onwards because of the Reserve Bank's efforts to restrict the home supply of loanable funds, and because of hardening loan markets in other countries. In the long-term investment market Government borrowing remained the dominant force on the demand side, and Government lending through the State Advances Corporation (the largest source of housing finance) the biggest single factor on the supply side. Bank lending rates, and insurance company and building society rates, were also subject to direct regulation by the Government. However, even before the Government-controlled system of interest rates was made somewhat flexible, the cost of liquidity tended to rise slightly because some borrowers were diverted from lower-interest sources to higher-interest sources.

Later, more particularly after the Royal Commission on money and banking had reported to the Government,[21] a degree of flexibility was introduced into the interest rate pattern. Average rates increased appreciably, but Government control remained and the Government, while insisting that its policies to combat inflation were being pursued vigorously, continued to deny that higher interest rates were a necessary or desirable concomitant of such policies.[22]

Up to the middle of 1952 the Reserve Bank had relied on direct control of bank advances and the doubtful powers of exhortation. Its policy was (and still is) very much dependent on the approval of the Minister of Finance, though it had a greater measure of independence

20. Cf. New Zealand Official Year Book, 1957, pp. 962 ff., for the terms of the Act.

21. *Op. cit.*, Wellington, 1956.

22. Cf. *Monetary and Fiscal Policy in New Zealand*, Wellington, 1955, pp. 155 ff. (where an official statement on interest rate policy as presented to the Royal Commission by the Treasury, is reproduced).

in practice after the report of the Royal Commission. Till half-way through 1952 its nominal power to vary reserve requirements of the trading banks had not been exercised. This had meant that since 1945 the banking system (with fixed statutory minimum reserve proportions[23]) had carried sufficient reserves most of the time to increase advances three- or four-fold. Then the effects of the minor post-Korean recession (including the effects of lagged tax payments on income for the boom year) reduced the excess liquidity of the banks and their customers. At this point ministerial approval was given to the use of variations in trading bank minimum reserve proportions, to be administered by the Reserve Bank approximately as they operate in the U.S. Federal Reserve system. The proportions were raised, with the effect that the five banks[24] now had, on an average, about twice the reserves they required to carry their existing level of deposits, instead of three or four times as much. Also in this year the Government set up a Capital Issues Committee (under war-time emergency finance regulations!), and the consent of this committee was required for capital issues over £10,000 in any 12 months' period.

Subsequently, variations in trading bank reserve requirements and high rates on advances to the trading banks by the Reserve Bank, brought the liquidity of the economy to a greater extent under the control of the monetary authority. Since 1956, although pressure has been relaxed at times when there have been signs of deflationary pressures becoming really effective,[25] Reserve Bank policy has been used to sustain a "credit squeeze".

However, the consequent restraint on expenditure in the private sector has been offset to some extent by expansion of public expenditure—especially in the last two years of the National Government when deficit financing in the special sense of the term as it has been used here[26] was revived.

Under these conditions—and particularly since export markets have weakened—a continued narrowing of the scope of quantitative controls of external trade and payments has been accompanied by chronic balance-of-payments difficulties.

4. *Conclusion*

The National Government has now passed on to its successors a balance-of-payments crisis and an armoury of discretionary powers which has been preserved virtually intact. The new Labor Government has not a working majority, but it did not need to get legislation through parliament in order to extend and tighten exchange and import controls and supplementary controls of economic activity. It

23. Namely, 7 per cent of demand liabilities and 3 per cent of time liabilities.
24. Each of the five trading banks has an extensive system of branches.
25. e.g. when annual payments of income tax have been due; and when difficulties have been encountered in the flotation of Government loans.
26. i.e. as stated above, deficit financing of a type which increases the liquidity of the economy. It implies a cash deficit, or an excess of public expenditure over revenue from taxation and public borrowing operations, and it has the effect of increasing the net indebtedness of the Government to the banking system.

simply applied, with greater force, the existing regulations as they had been applied in similar but less desperate situations in the previous eight years.

It was not a socialist platform which returned the Labor Government. In the matter of tax concessions, which had been a regular feature of annual budgets of the National Government, it simply made a higher bid. On the protection issue it did essentially the same thing. These were the main issues.

Both parties were committed to the protection of local industry, but the former government had persisted (in spite of periodic backsliding) with the removal of direct controls of imports by the exemption of specific types of transactions. It had reached a point where further progress in this direction was thought incompatible, unless tariffs were revised, with its protectionist policy. The *ad hoc* nature of this policy is brought out starkly by the following official statement:[27]

> No major changes were announced in the 1957 Import Licensing Schedule. Nine new items including tobacco pipes and a wider range of children's footwear were exempted from licensing if imported from non-scheduled countries,[28] and control was reimposed on men's nylon socks and women's and girls' ankle socks. Particular attention was paid to clothing because of imports from low-cost countries, and it was announced that licences for certain items would be granted on a quantity instead of a value basis. Further decontrol was not possible for 1957 as a stage was reached where 80 per cent of imports from non-scheduled countries did not require a licence. Any marked increase in liberalization will not be possible until the whole structure of import duties has been examined in relation to the needs of New Zealand industry.

Among manufacturers and wage-earners[29] there was considerable opposition to "liberalization" even in these terms. Labor offered a larger measure of protection, and the greater certainty of protection by means of quantitative controls.

Both Governments had, at times, used monetary expansion in such a manner that if it were continued it must have led to a continuing process of socialization; but, oddly enough, it was the National Government which devised the more effective means towards such an end. This was the combination of increasing government expenditure with a "credit squeeze" limiting private expenditure. This was bound to increase the share of national resources devoted to public enterprise, and this was its effect when, in the last two years of the late government, Reserve Bank policy achieved a measure of effectiveness. As a proportion of gross national product, central government expenditure was substantially reduced from war-time levels by the Labor Government, and while Labor remained in office local body expenditure was not allowed to rise appreciably above the low war-time levels. Under the National Government, central government expenditure was held fairly constant in relation to aggregate income and outlay,[30] but in-

27. New Zealand Official Year Book, 1957, p. 305.
28. i.e. countries outside the dollar area, excluding Japan.
29. For over 50 years, since wage arbitration on a national scale became firmly established, a community of interests between manufacturers who want a greater measure of protection and wage earners who want higher wages, has been a significant political factor.
30. See *Report of Royal Commission*, 1956, pp. 456-463; and *Abstract of Statistics*, monthly, October and November, 1957.

creasing expenditure by local bodies resulted in an appreciable increase in the relative importance of public enterprise.[31]

In spite of all these things Professor Condliffe is amply justified in his inference that the National Party is anti-socialist in its long-run intentions, and the Labor Party has socialist leanings. However, when the government (whatever its party background) is committed to certain specific long-run aims and limited by certain continuing economic trends, intentions of a general nature may have little significance except for platform purposes. This is certainly the case in New Zealand, where the government is continuously preoccupied with short-run issues arising in the context of a long-run process of population growth and industrialization.

Thus short-run problems of economic policy in New Zealand are generally placed in a context of rapid population growth and economic development. The government, whatever flag it flies, is in business to deliver the goods to the voters by the most effective means to hand. In these conditions—and in a small country with a relatively homogeneous population and a strong equalitarian tradition—public enterprise often appears to be the only means of "delivering the goods".

At any rate this is the case as long as New Zealanders are determined to do things their own way and not rely on foreign investment or entrepreneurship, and as long as there is no highly developed home capital market. This goes some way towards explaining generations of government management (in part or in whole) of export marketing, railways, forestry, land development, electric power supply, medical and health services, and so on.[32] It explains, too, some of the more conspicuous extensions of public enterprise under the late National Government as a response to an urgent demand for increased power supplies, improved road and rail communications, and manufacturing capacity to utilize the rapidly maturing State forests.

In some respects these are the problems of the relatively underdeveloped economy. Measures of income per head, degree of mechanization, and urban development, seem to indicate that New Zealand is one of the more advanced of modern economies. But in the absence of a capital market and a supply of entrepreneurship commensurate with the scale of investment required for the maintenance (with current standards of consumption) of the current rate of development, government initiative remains dominant.

This state of affairs dates from pioneering days when there was no apparent alternative. It endures and, by maintaining conditions unfavourable for the development to maturity of a private capital market and private entrepreneurship, tends to perpetuate itself.

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31. *Economic Survey*, 1955, '56 and '57; and *Abstract of Statistics*, June, 1957, pp. 10-11, September, 1957, pp. 7-11.

32. See Condliffe, *op. cit.* (*New Zealand in the Making*), Pember Reeves, *op. cit.*, and W. P. Morrell, *op. cit.*, for historical accounts of public enterprises in New Zealand.

THE GROWTH OF THE CEMENT INDUSTRY IN THE 1920's: A STUDY IN COMPETITION

1. *The Demand for Cement*

The use of Portland cement on a large scale has been a development of the twentieth century. After its discovery in the early nineteenth century, its widespread application waited upon the invention of the rotary kiln in the 1890's, which made possible a great reduction in cost as well as a standardization of product. The rise in consumption in Australia was remarkable. By 1913 it had reached 325,000 tons, then, after a decline during the war, it rose again to a peak for the 1920's of over three-quarters of a million tons in 1927-28.

A major source of this demand for cement lay with public authorities, particularly for such works as dams, irrigation channels and pipes, and water supply and sewerage.[1] By 1914 the Interstate Commission considered that the demands of the various State Governments had reached "exceptional proportions",[2] and these demands increased with the active developmental role played by governments in the 'twenties and the necessity of constructing a road system to cope with the flood of cars unleashed in this decade. In New South Wales, in the six years up to 1926, the consumption of cement for State purposes, including the requirements of the Public Works Department, the Metropolitan Board of Water Supply and Sewerage, the Sydney Harbour Trust and the Railway Commissioners averaged 60,000 tons per annum,[3] while in one year, 1923-24, it was over 70,000 tons.[4] If the other States consumed cement at the same rate per head as N.S.W., total demand from State Governments in the middle 'twenties would have been about 200,000 tons, or two-fifths of the total Australian consumption. These N.S.W. figures probably do not include cement purchases by local authorities, so that total purchases by public authorities would be higher by that amount.

1. Many of the cement products for public works were manufactured by private firms, which depended on government spending for their main market. Perhaps the most important was the principal manufacturer of concrete pipes in Australia, Hume Pipe Company (Australia) Ltd. The manufacture by this firm of centrifugally spun reinforced concrete pipes was based on a process invented by the brothers W. R. and E. J. Hume. The invention revolutionized pipe manufacture and the rights were sold throughout the world. (*Annual Reports*, 1920-21 to 1929-30.) One of the firm's subsidiaries placed such value on the inventive activities of W. R. Hume that it insured his life for £20,000. (*Hume Steel Ltd. Directors' Report*, Year ended 30 September 1929.)

2. *Interstate Commission, Tariff Investigation, Portland Cement Report*, 26 May 1915, p. 4.

3. *Report of Parliamentary Committee on Public Works on Proposed Works for the Manufacture of Portland Cement at a Site at Carlos Gap*, 18 Nov. 1926, p. vii.

4. R. T. Ball, Minister for Public Works, *N.S.W. Parl. Debates*, 24 Sept. 1924, p. 2210.

It was not only in the public sector that the use of cement increased. In the 'twenties the construction of buildings was revolutionized by the application of reinforced concrete. Until then, in Sydney at least, legislation had limited the use of this material,[5] and the first building of reinforced concrete was not constructed there until 1919—this was Angus and Coote's premises facing the central entrance of the Queen Victoria markets.[6] As the advantages of reinforced concrete and the technique of its construction became more widely known its use rapidly extended.[7] In the cities it was also used in conjunction with another new building process—the steel frame—to erect the large buildings that high land values made necessary. Both these developments completely altered methods of building construction and opened new avenues for the utilization of cement.

The demand for cement, therefore, was much more buoyant than for traditional building materials such as bricks. It was supported from two sources: bricks relied principally on general private building, while cement found equal support from public investment. In the depression, of course, both these props were to prove weak. But in the 'twenties not only was the base for the demand broader, but the improvements in the quality of cement, the spread in knowledge of its usefulness and the increasing number of uses to which it could be put, meant that it was replacing other building materials as well as creating new demands.

Under these influences the consumption of cement expanded at a different pace and in a different pattern as compared with other building materials. For instance, brick output in the 'twenties grew to 807,000,000 in 1923-24, fell a little in the next two years and then reached a peak for the 'twenties of 838,000,000 in 1926-27, only slightly higher than the 1923-24 figure.[8] Cement output, on the other hand, grew continuously from 1923-24 to 1927-28 and during this period increased by over fifty per cent.

In many uses cement is complementary to other building materials, but bricks and wood undoubtedly felt its effect as a competitive material. This effect is hard to demonstrate as inter-commodity competition was only one, and not the most important, influence on the price and output patterns of building materials. However, contemporary observers thought they saw the influences of this competition; for instance, in 1924, the *Age* noted with pleasure that the brick combine

5. As one contractor complained: "In Australia the use of cement is in its infancy; our builders are builders of iron, stone and brick. As far as Sydney is concerned, the Building Act forbids the economic use of reinforced concrete. Amend this Act, then our architects will soon show how great roomy buildings will be erected without such ponderous walls as are being erected in Sydney today." Evidence of James Angus, Appendix to *Interstate Commission Report, op. cit.*, p. 29.

6. *Australasian Manufacturer,* 3 May 1919, p. 20.

7. In the 20's the advantages of concrete over other building materials were seen to be in cost, strength, durability, maintenance and freedom from fire. See e.g. *Australasian Concrete,* Mar. 1921, p. 5, and *Australasian Engineer,* 31 July 1925, p. 5.

8. *Production Bulletin,* No. 23, p. 148.

in Melbourne had been forced to reduce its prices, and it thought that the prime reason must be "the use of reinforced concrete in the building of large premises".[9] Also, although competition from cement would be felt mainly by bricks, Jobson, in discussing the depressed conditions in the timber trade, noted that "timber is not now as favoured as it was for buildings, and the preference for any construction of importance is for steel and cement".[10]

2. *The Industry Before the War*

To meet the rapidly rising demand, local production expanded to reach an estimated 200,000 tons by 1913.[11] Official statistics are few, but a picture of this growth can be given for New South Wales; there, production was 13,400 tons in 1902, 68,333 tons in 1908, 108,390 tons in 1911 and 127,981 tons in 1913.[12] However, notwithstanding the expansion of their plant, local manufacturers were unable to meet the demand, and imports grew from 25,700 tons in 1907 to 125,600 tons in 1913.[13]

The local industry had the double protection from overseas competition of a high tariff and the high transport costs of cement. The importance of this protection in 1913 can be seen in the table below:

Imports of Portland Cement

	Origin	
	Continental	*United Kingdom*
F.o.b. cost per cask	5/–	5/–
Freight and other charges	3/6	4/3
	8/6	9/3
Duty	3/4	2/6
On wharf at Sydney per cask	11/10	11/9
Thus freight, etc., as percentage of f.o.b. value	70%	85%
Thus duty as percentage of f.o.b. value	66·7%	50%

Source: *Interstate Commission Report, op. cit.*, p. 3.

With such a high level of protection, local manufacturers were in a favourable position, and it was only because of their inability to expand at a sufficient rate that imports were continued. The price of imports was used to set the price in the market; thus the secretary of the Commonwealth Portland Cement Company stated that "our policy has always been to keep just under the imported price".[14] This sellers' market meant that the price of cement in Australia was over double that in the United Kingdom, and that there was no inducement for

9. *Age*, 10 Sept. 1924, p. 9.
10. *Jobson's Investment Digest*, Aug. 1928, p. 388.
11. *Interstate Commission Report, op. cit.*, p. 4. The Commission considered that this figure was calculated with "fair accuracy".
12. *Annual Report of the Dept. of Mines, N.S.W., for the Year 1918*, p. 49.
13. *Overseas Trade Bulletins*, Nos. 5 and 11.
14. *Interstate Commission Report, op. cit.*, p. 5.

Australian producers to compete amongst each other. In New South Wales there were two producers: the Commonwealth Portland Cement Co. Ltd. with an output of around 100,000 tons and Goodlet and Smith, a much smaller producer. These two companies had a "loose arrangement" as to price, and always knew each other's quotes for government business.[15]

This market situation made cement manufacture a very profitable undertaking, and just before the war several new firms entered the industry. Although the war reduced import competition to a minimum, the demand for cement also fell since there was a decline in the quantity of public works and building. However, the new entrants in the industry did not drastically upset the relationships between the firms; the Interstate Commission in 1919 found "there is no formal agreement between the cement manufacturers, but there is an understanding between the principal manufacturers and they fix prices".[16]

3. *The Growth of the Industry in the 'Twenties*

Output figures are available for New South Wales during the 'twenties, but they were collected for the Commonwealth as a whole only from 1923-24. Even after that year there are no separate statistics published for the other States.

Cement

('000 Tons)

Year	Output		*Imports*	*Consumption*[1]
	N.S.W.	*C'wealth*		
1919–20	92	n.a.	6	n.a.
1920–21	160	n.a.	27	n.a.
1921–22	163	n.a.	24	n.a.
1922–23	201	n.a.	45	n.a.
1923–24	224[2]	492	29	521
1924–25	272[2]	578	26	604
1925–26	306	605	23	628
1926–27	365	638	19	657
1927–28	432	754	23	777
1928–29	415	708	22	730
1929–30	423	697	15	712

1. Consumption taken as output plus imports.
2. Calendar year ended six months previously.

Sources: N.S.W. output from *N.S.W. Statistical Register*, 1919-20 to to 1929-30, and *N.S.W. Official Year Book*, 1926-27, p. 346. Commonwealth output from *Production Bulletins*, Vols. 18 to 24.
Imports from *Overseas Trade Bulletins*, Vols. 17 to 27.

The growth in output for the Commonwealth was rapid; it increased by roughly one half in the four years between 1923-24 and 1927-28, and probably increased about threefold between 1920 and

15. *Ibid.*, p. 4.
16. *Interstate Commission, Prices Investigation, No. 12 Report, Rents*, 24 Apr. 1919, p. 34.

1927-28. New South Wales was the most important State, producing over half the total output. Local production met nearly all the demand and imports were limited to certain high-grade cements.[17] The exclusion of imports was assisted by the freight and by a high tariff of B.P.T. 1/-, I.T. 1/-, G.T. 1/6 per cwt., which had been imposed originally in 1914. Because of the war it had not been needed and it was left unaltered in the general tariff adjustment of 1920 at the request of the cement manufacturers, not because they thought it unimportant, but because they thought it was already sufficient to exclude foreign competition.[18]

The expansion in production was the result both of the growth of existing firms and of new firms entering the industry. The profits of established companies were very satisfactory and acted as a strong inducement to new firms. For instance, Kandos Cement Co. Ltd. paid 10 per cent dividends for every year of the 'twenties;[19] after it became a public company in 1924 Australian Cement Ltd. paid between 10 per cent and 15 per cent,[20] while the Adelaide Cement Co. Ltd. between 1921-22 and 1929-30 normally paid 15 per cent and also made a bonus share issue in 1924-25 of £55,000 to a shareholders' capital of £126,000.[21] However, entry into the cement industry was not easy, since large amounts of capital were needed and the established firms were formidable prospective rivals.

In New South Wales, at the beginning of the decade, there were two companies in existence and these remained the major producers. The Commonwealth Portland Cement Co. was a private company in which the entire shareholders' funds were held in England; by 1928 these funds amounted to £600,000, assets were £1,448,000 and the capacity of the works at Portland was about 200,000 tons per annum.[22] This company remained the only one in which there was a substantial foreign shareholding. Kandos Cement Company Ltd. was roughly the same size and its works at Kandos also had a capacity of about 200,000 tons per annum.[23] Three other companies were established in New South Wales to manufacture cement. One was the Standard Portland Cement Co. Ltd. which began production in 1926-27,[24] and which had a capacity of about 100,000 tons.[25] This firm was also at Kandos, so that Commonwealth, Kandos and Standard were all on the Mudgee railway line,

17. *Parliamentary Standing Committee on Public Works, op. cit.*, Minutes of Evidence, p. 4, Evidence of G. W. Mitchell, General Manager, State Industrial Undertakings.

18. Statement by W. M. Greene, Minister for Trade and Customs, *Parliamentary Debates*, Vol. XCV, pp. 9126-27.

19. *Kandos Cement Co. Ltd., Directors' Reports*, years ended 30 June 1921 to 30 June 1930.

20. *Australian Cement Ltd., Directors' Reports*, years ended 30 November 1925 to 30 November 1930.

21. *Adelaide Cement Co. Ltd., Directors' Reports*, years ended 31 May 1920 to 31 May 1930.

22. *Jobson's Investment Digest*, Mar. 1928, p. 106.

23. *Ibid.*

24. *Standard Portland Cement Co. Ltd., Directors' Report*, year ended 30 June 1927.

25. *Jobson's Investment Digest, loc. cit.*

Portland being 112 miles from Sydney and Kandos 154. In this area the necessary raw materials—limestone, shale and coal—were all adjacent to one another as well as being close to transportation by rail. The two other New South Wales cement works were established by powerful companies whose major interests lay outside this industry. The Sulphide Corporation Ltd. had refining works for base metals at Cockle Creek; there it established cement works which, by the end of the decade, had a capacity of about 100,000 tons.[26] Southern Portland Cement Ltd. was situated at Berrima and was formed jointly by Australian Iron and Steel Ltd. and Howard Smith Ltd.; it began production in 1929 and capacity was scheduled to be 120,000 tons.[27]

In Victoria there was virtually only one producer, Australian Cement Ltd., with works at Fyansford, near Geelong. This company was formed in 1925 to take over an existing company, Australian Portland Cement Co. Pty. Ltd., and its capacity towards the end of the 'twenties was about 200,000 tons.[28] Alarmed by the development of new companies in New South Wales the company made a policy of consistently maintaining capacity in excess of demand so as to discourage potential competitors.[29]

The size of the companies was much smaller in the other States. In South Australia there were two established companies—Adelaide Cement Co. Ltd. (40,000 tons) which began production in 1914, and South Australian Portland Cement Co. Ltd. (30,000 tons), dating back to 1891. In Queensland there was only one firm—Queensland Cement and Lime Co. Ltd. (55,000 tons), which began production during the war.[30] In Western Australia, the Western Australian Portland Cement Co. Ltd. was formed in 1918 and produced its first cement in 1920; in 1927 it was reconstructed into a new company—Swan Portland Cement Ltd.

It was in Tasmania that the only unprofitable cement venture took place. National Portland Cement Ltd. was established at Maria Island off the east coast of Tasmania and began production there in 1924. For several years in the mid 'twenties production averaged around 30,000 tons, but there were continual difficulties and operations finally ceased in 1929.[31] In a general way, the firm suffered from the failure of Tasmania to develop as rapidly as expected, but there were also more particular setbacks: the cost of establishment exceeded estimates, delivery of machinery was delayed and the first limestone quarry opened up proved faulty.[32] Almost all the shareholders' funds were lost in this undertaking. When the works were ultimately sold to Australian

26. *Ibid.*
27. *Ibid.*, Sept. 1928, pp. 397-8.
28. *Ibid.*, Mar. 1928, pp. 106-7.
29. *Australian Cement Ltd., Directors' Report*, year ended 30 Nov. 1925.
30. Capacity estimates given in brackets relate to 1928 and are from *Jobson's Investment Digest, loc. cit.*
31. See *National Portland Cement Ltd., Directors' Reports*, years ended 30 June 1923 to 30 June 1928.
32. Report in Melbourne *Herald*, 3 Oct. 1928. A press cutting seen at the Melbourne Stock Exchange.

Cement Ltd., payment was made in the latter's shares and amounted to only 1/9 in the pound on £100,000 preference shares and 8d. in the pound on £279,000 ordinary shares.[33] Another small Tasmanian company, Tasmanian Cement Pty. Ltd., began production in 1925 at Railton in Northern Tasmania, where over £200,000 had been invested in plants for cement manufacture and shale oil retorting.[34] However, in 1924, agreement had been reached with Dorman, Long and Co. Ltd., the English firm in charge of the construction of the Sydney Harbour Bridge, by which Dorman, Long took over the management of the firm, invested "a large sum of money in the works", while the firm became responsible for the supply of cement for the bridge.[35] The output of the firm was not large, reaching about 25,000 tons per annum by 1928.[36] In that year the firm expanded into a public company, Goliath Portland Cement Co. Ltd. and Dorman, Long continued to direct the management.[37] Capacity of the plant was increased to 135,000 tons by 1930,[38] and it was the intention of the company to sell a large proportion of this cement on the Melbourne market.[39]

4. *Technological Development*

Portland cement came into popular use with the development of the rotary kiln about the turn of the century. Subsequent technical developments within this industry up to 1930 included a great increase in the size of the rotary kilns, a reduction in fuel consumption, mechanization of the production process, including quarrying, packing and distribution, and the creation of new types of cement for special purposes.[40] These innovations had their origins abroad, but it seems that the Australian industry quickly adopted them. The rapid growth of the industry in the 'twenties meant that most of the equipment was up to date; new firms established themselves with new plant while the profits of the established firms enabled them to make very adequate provision for replacement. That the new equipment purchased was of the most modern type was assured by the position of the firms supplying the equipment. This industry was dominated by a few large firms which kept a leading position in the development of technology for making cement, and provided buyers with designs for new factories and the technical knowledge for production.[41]

33. *Jobson's Investment Digest*, Dec. 1929, p. 731.
34. *Age*, 30 July 1925, p. 11.
35. *Industrial Australian & Mining Standard*, 30 Oct. 1924, p. 639. It is not known how much money was invested by Dorman, Long in the original company in 1924, but in 1934, out of 255,857 ordinary shares of Goliath, Dorman, Long held 22,578. (Shareholders' List at Melbourne Stock Exchange.)
36. *Prospectus of Goliath Portland Cement Company Ltd.*, 31/7/1928.
37. *Argus*, 17 July 1928, p. 14.
38. *Jobson's Investment Digest*, Oct. 1929, p. 555.
39. *Ibid.*, Sept. 1928, p. 400.
40. See e.g. Ingar Svennilson, *Growth and Stagnation in the European Economy* (United Nations Publication, 1954), p. 156.
41. *Ibid.*, pp. 156-7.

Rotary kilns were operated in Australia as early as 1908 by the South Australian Portland Cement Co.,[42] and it is possible that the two main companies in Victoria and New South Wales had them even earlier. All further installations were of this type, and the development in their size was most marked. The attitude of one of the older companies to technical development can best be shown by this description of its works:[43]

> A contract has been let by the Australian Portland Cement Co. to the Monier Concrete Co. to build four silos at the terminus of the Fyansford railway for the storage of the company's cement. Each silo will be 75 feet in height, with a diameter of 35 feet, and will have a capacity of 1,500 tons. The cement company's packing house will be alongside, and will be equipped with machines capable of bagging the cement at the rate of 2½ tons per minute. The silos will be automatically filled with cement by means of conveyors from the works. The cost of the new silos, about £20,000, is only an item in the expenditure which the cement company has in view. Its policy has always been to keep ahead of the demand, and while the output has increased twentyfold in the last eighteen years, the plant has been entirely replaced by improved machinery on three occasions within that period, and it is contemplated by the directors to lay out about £250,000 during the next two years in effecting further improvements.

In the cement industry capital costs per unit of output were always high, while labour costs were low, and the ratio between the two was further increased by the mechanization of production which was taking place in the 'twenties.[44]

An outstanding development in the industry was the production of a quick hardening cement. This new type of cement greatly affected the uses to which cement could be put, since in two or three days it gave the strength only obtained from ordinary cement in three or four weeks.[45] Production began in Australia in the last few years of the decade, and brands of cement blossomed with such names as "Celerite", "Speedite", "Quickardo", "Rapidite" and "Rapidard".

A distinct advance was made in cement packaging through the development of paper bags as an alternative to jute. It was claimed that paper bags were cheaper, gave better protection against the weather and were more convenient to handle.[46] Production was begun in 1926 by an Australian company, Bates (A/Asia) Ltd., which used wholly Australian raw materials to produce a multi-walled bag "composed of five separate walls of tough pliable water-resisting paper—bound, glued and sewn on top and bottom".[47]

42. *Brighton Cement Handbook 1892-1952* (issued by the South Australian Portland Cement Co. Ltd.), p. 7.

43. *Age*, 7 Jan. 1924, p. 5.

44. See e.g. the evidence of F. E. Morton, Engineer of Australian Cement, in evidence to the Commonwealth Arbitration Court in *Amalgamated Engineering Union and Others v. Metal Trades Employers' Association and Others*, 7/8/1929, Transcript of Evidence, p. 3808. ". . . we have been spending a great deal of money on the works in one way or another. We have been improving them and we find that we want fewer men, and that will be more so in the future."

45. For a general description of the development of quick hardening cement, see evidence of G. W. Mitchell to *Parliamentary Standing Committee on Public Works, op cit.*, p. 3.

46. *South Australian Portland Cement Co. Ltd., Directors' Report*, half-year ended 30 June 1927.

47. Advertisement in Adelaide *Advertiser*, 26 July 1927, p. 17.

5. *Excess Capacity*

The cement industry is one in which excess capacity typically arises. Rapid technical improvements have meant a high rate of obsolescence for existing equipment, but after amortization old equipment may still be capable of operation because of the very low labour costs per unit of output. Technical improvements have increased also the size of kilns; some in Australia had a capacity of over 50,000 tons by 1930 and these kilns, of course, required 24 hours a day and seven days a week operation for maximum efficiency. In addition, seasonal and cyclical fluctuations are important general causes of excess capacity, but in Australia the seasonal fluctuations in building are not important because of the mild winters, while in the 'twenties excess capacity began to develop in a period in which demand was growing.

However, apart from the technical developments in the industry, there were some special factors in Australia which encouraged the development of excess capacity. One was the division of the country into six separate States, in each of which the economy and economic policy were, in some degree, different from the others. Cement factories were set up in each of the States, and this was probably warranted by the pattern of population and the freight on cement. It meant, however, that the natural tendency to excess capacity was encouraged in six separate places. The establishment of the cement works in each State was further encouraged by the preference often given by State authorities in their contracts to local factories. For example, in 1926, a considerable stir was caused by the allotment of a Victorian contract to companies established in New South Wales and Tasmania; it was claimed that in retaliation against these States for discriminatory practices, one-third of the contract should be allotted to a Victorian company.[48] Again, in 1927, the sewerage committee of the Melbourne and Metropolitan Board of Works recommended sharing a contract between five tenderers, three of which were interstate. The Board, however, overruled the committee and allocated the contract to the two Victorian companies.[49]

It was natural, too, that in each State existing firms should deliberately create excess capacity in order to discourage potential rivals from establishing a business there. This was the admitted policy of Australian Cement,[50] while in 1923 Kandos hopefully stated that additional machinery had been installed "giving an output which will meet the probable requirements of the State for some considerable time".[51] The Queensland company expressed the same hope.[52]

Excess capacity was encouraged also by the fact that public expenditure and building construction behaved in a different fashion in

48. *Argus*, 27 Oct. 1926, p. 24.
49. *Ibid.*, 31 Aug. 1927, p. 23.
50. *Australian Cement Ltd., Directors' Report*, year ended 30 Nov. 1925.
51. *Kandos Cement Co. Ltd., Directors' Report*, year ended 30 June 1923.
52. *Queensland Cement and Lime Co. Ltd., Annual Report*, year ended 31 July 1922.

the various States. For example, building continued at a high rate in the final years of the 'twenties in Sydney. Cement output in New South Wales did not reach a peak until 1927-28 and then remained practically constant until 1929-30. In South Australia, on the other hand, economic difficulties were pronounced after 1926-27, and the output of cement of the South Australian Portland Cement Company fell steadily from 26,741 tons in 1926-27 to 13,501 tons in 1929-30.[53]

As well as the division of Australia into separate States, the optimistic expectations of the local producers led to the provision of capacity in excess of the demand. Cement was in short supply for the first years of the 'twenties and, as recent experience in the coal industry has demonstrated, it is easy to over-estimate the size of a shortage. Undoubtedly this caused manufacturers to expand capacity beyond actual requirements while, at the same time, since plans were based also on the rapid rise of demand in the past, even a slowing down in this rate would disappoint expectations. Further, as will be shown below, the price policy of the existing firms induced new firms to enter the industry.

How great was this excess capacity and at what rate did it develop? Capacity is extremely difficult to define and more difficult to measure even where an abundance of statistical material is available. In Australia there is no such material, so the treatment of this subject must be in general terms. Cement was in short supply for the first few years of the decade and manufacturers found it impossible to meet the demand. This condition persisted into 1922 and for the next two years there appears to have been a rough balance between supply and demand, until the possibility of over-production began to appear about the end of 1924.[54] In June, 1925, when output was at the rate of approximately 600,000 tons per annum, the chairman of Australian Cement Ltd. claimed that the plant capacity of Australia could produce 785,000 tons.[55] By the middle of 1926 the *Industrial Australian and Mining Standard* estimated that capacity had risen to 831,500 tons and there were a further 160,000 tons under construction.[56] These figures suggest that excess capacity began to develop in the industry from about the middle 'twenties. The problem was not acute as long as demand rose quickly, as it did until 1927-28, but growth then ceased at the same time as two new companies placed their product on the market. It seems probable that by 1930 the industry could have produced 1,000,000 tons with ease but the output in 1930-31 was only 389,000 tons.

6. *Co-operation within the Industry*

Problems of excess capacity in the cement industry throughout the world have normally been met by some form of agreement limiting competition. The industry in Australia was no exception. Even before

53. *Brighton Cement Handbook, op. cit.*, p. 14.
54. See e.g. *Argus*, 20 Nov. 1924, p. 15.
55. *Industrial Australian and Mining Standard*, 4 June 1925, p. 741.
56. As reported in *Jobson's Investment Digest*, June 1926, pp. 307-8.

the beginning of the decade of the 'twenties the principle of co-operation by the firms within the industry in fixing prices was firmly established. As long as local industry did not have the capacity to meet the demands of the market, as was the position before the war, imports were the price leader and co-operation was easy. This situation continued for the first few years of the 'twenties. It was not until the end of 1924, when over-capacity began to appear, that co-operation raised problems. The emergence of excess capacity was, in part at least, the result of the successful co-operation between the existing firms in keeping prices at a high level and thus inducing new firms to enter the industry. The manager of the Commonwealth company had to agree with a member of the Tariff Board when he stated: "What I am putting to you is not original . . . they [i.e. the new companies] came into existence because the flowers were blooming too prolifically, so to speak. The thing appeared to be too attractive".[57] On the other hand, although co-operation encouraged the emergence of excess capacity, the excess capacity itself made co-operation all the more necessary for the firms involved.

In New South Wales the relation between price co-operation and the entry of a new firm into the industry was quite direct. In this State the two producers, the Kandos and Commonwealth companies, were faced with a powerful buyer, which, because of the large amounts of cement it consumed, was in a position to bargain. This buyer was the State Government. At the end of 1920 the Dooley Labor Government entered into a contract with the Commonwealth company for the supply of cement at the rate of £5/8/- per ton. In 1924, in defence of the price, Mr. Dooley claimed that in 1920 cement was almost unprocurable, and that the cheapest price on the market was £8/10/- per ton, while some was being sold at £10 and £11 per ton.[58] The difficulty concerning price in 1920 was not disputed, but the contract had other objectionable features. Delivery did not start until 17 months after the contract was made and it then operated for two years, except on certain public works where it had to be used until the job was completed.[59]

With the expiration of this contract in 1924, tenders were called for the supply of cement at the rate of 50,000 tons per annum and the two existing New South Wales companies submitted almost identical tenders. Although some conditions were different, each required a five-year contract with adjustment for any wage changes, but the unacceptable feature of their tenders was the price. The Commonwealth Company's price was £4/11/6 per ton free on rail at Portland, while the Kandos Company's price was £4/4/2 free on rail at Kandos. The difference between the two prices would be much smaller when allowance is made for the higher freight from Sydney to Kandos, and both

57. *Tariff Board Supplementary Report on Portland Cement*, 6 Mar. 1936, p. 4.
58. *N.S.W. Parliamentary Debates*, Vol. 97, 3 Sept. 1924, p. 2151.
59. Statement by R. T. Ball, Minister for Public Works, *ibid.*, p. 2162.

prices would probably have been a little over £5 a ton delivered in Sydney.[60]

The State Government took the view that the tenders were far too high and that no real competition was taking place between the two companies. It therefore took the unusual step of alloting the contract to a company which was formed solely in the hope of obtaining the contract and whose main assets were the rights to the raw material. This company was Cement Products Ltd., and after obtaining the contract it proceeded to float Standard Portland Cement Co. Ltd., with the contract as its main inducement to investors, while it sold its assets to the new company for 75,000 shares.[61] The contract was for three years and was at the price of roughly £3 a ton free on rail at the works near Kandos and £4 a ton delivered in Sydney.[62] Allowance was made for wage changes, but the price was at least £1 a ton below the tenders of the two established New South Wales companies.

Co-operation between the existing companies continued. The Standard Company did not start production until January, 1927, and then most of its output was absorbed by the government contract. Sulphide Corporation began production in April, 1925, but only at the rate of 30,000 tons per annum and output was not expanded for another two years,[63] Thus for a Victorian Government contract in 1926 there were three tenders, all the same price;[64] and again in 1927 with five tenders, prices were equal.[65] However, the outlook for price co-operation began to look more difficult in 1928: existing companies had expanded capacity, Southern Portland Cement was soon to begin production and the Goliath company had been formed in Tasmania with eyes on the Melbourne market. With these developments in mind the chairman of one of the major companies warned against a price war:[66]

> Today we are holding our cement prices at a steady level. The Kandos Company is making its price a standard price—with concessions for such public utilities as roads—and is keeping it there. The company will not declare a cement price-cutting war. We will keep our prices up. If our competitors force us into a corner, which is unlikely, since there is harmony in the cement industry, we shall be in a position to meet that contingency.

New competitors did, however, accommodate themselves to this harmony. In June, 1930, the New South Wales Minister for Local Government stated that he had to accept a price from the "Cement Association" of £4/2/- per ton f.o.r. at any of the cement works in the State, or £4/17/6 delivered in Sydney, irrespective of the origin of the cement.[67] When the New South Wales Government contract came up

60. *Ibid.*, pp. 2208-9.
61. Standard Portland Cement Co. Ltd. Prospectus, as reported in *Jobson's Investment Digest*, Apr. 1924, p. 152.
62. R. T. Ball in *N.S.W. Parliamentary Debates*, Vol. 97, p. 2211.
63. *Jobson's Investment Digest*, Mar. 1926, p. 119.
64. *Argus*, 27 Oct. 1926, p. 24.
65. *Ibid.*, 31 Aug. 1927, p. 23.
66. Mr. Stewart, Chairman of Kandos Cement Co. Ltd., *Sydney Morning Herald*, 22 Aug. 1928, p. 17.
67. M. F. Bruxner, *N.S.W. Parliamentary Debates*, Vol. 123, p. 6080. "Cement Association" were the words used by Bruxner; for a discussion of this Association, see below.

for renewal, this time at the rate of 65,000 tons per annum, the Standard company again refused to fall in line. The Sulphide, Southern, Commonwealth and Australian companies all tendered the same price, but the Standard company tendered a price which was lower in Sydney by 4/- to 6/- a ton, and obtained the contract.[68]

By what procedure did the manufacturers reach agreement on prices? The only formal merger of interests was between two of the three largest producers. In December, 1929, Kandos Cement Co. Ltd. and Australian Cement Ltd. combined to form Australian Portland Cement Pty. Ltd., as a holding company controlling the two operating companies. Until this merger Kandos had been a large supplier of the Victorian market, but its profits had been absorbed by the freight and handling charges. After the merger, all Victorian orders on the company were supplied from Geelong.[69]

The formation of an organization of a different kind took place in 1928 when all the cement manufacturers, except the Swan Company in Western Australia, formed The Australian Cement Manufacturers' Association. According to the memorandum of association, its object was "to promote encourage foster develop and protect by lawful means the cement industry, and to further and develop the use and demand for cement generally".[70] The cement manufacturers strenuously denied that the Association had anything to do with price fixing and, after studying its activities in the early 'thirties, the Tariff Board accepted this argument. But the Board found all the evidence of a firm agreement—including the division of the market between the manufacturers in the same proportion as they held before the depression—and it concluded that the only way to reduce the price was to lower the tariff and permit import competition.[71] There appears, then, to have been little or no formal machinery with which prices were controlled; probably, as one manufacturer claimed, it was a mixture of price leadership and "gentlemanly understanding".[72] However, notwithstanding the Tariff Board's conclusion on the Cement Association, the history of the cement industry in the 1920's gives no reason to doubt the general truth of Adam Smith's dictum about meetings of business men:[73]

> People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices.

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68. A. E. Buttenshaw, Minister for Public Works, *N.S.W. Parliamentary Debates, op. cit.*, p. 6075.
69. *Sydney Morning Herald*, 22 Aug. 1930.
70. *Tariff Board Report on Portland Cement*, 22 March 1936, p. 6.
71. *Ibid. passim.*
72. *Ibid.* Transcript of Evidence, p. 57. Evidence of J. Symonds, General Manager of Commonwealth Portland Cement Co. Ltd.
73. *The Wealth of Nations*, ed. E. Cannan (2 Vols., Methuen, London, 1925), Vol. 1, p. 130.

THE PATTERN OF AUSTRALIAN DEMAND

1. *Data and Method*

The measurement of the relationship between consumers' demand for various commodity groups and their income, or total expenditure, is a comparatively easy matter if satisfactory family budget data are given. Furthermore, the results derived from such studies may, with certain qualifications, be used in connection with time series to obtain demand functions in their general form, i.e. consumption as a function of income, own price, other prices and other factors. It is a different matter when time series alone are available; the problem then arises how to extract information from the data without overloading them by asking for too much and in consequence getting unreliable results. Such is the position with regard to Australia.

In the present study, an attempt is made to construct Australian demand functions for four commodity groups among which all consumption expenditure is divided. The groups are those used in the officially published retail price indices, viz. Food, Housing, Clothing, and Miscellaneous. The present analysis is somewhat in the nature of a pilot study, and it is hoped to break consumers' expenditure down further when adequate expenditure and price data have been obtained.

One of the difficulties arising in a study of this kind consists in finding the best series to indicate income. To simplify matters, total consumption expenditure, which is the sum of the outlays on the four commodity groups, has been chosen in the first instance. Later on, the relationship between income and total outlay, and the possibility of introducing income into the demand functions, will be considered.

The postulated demand functions represent relationships between expenditure per head on food, housing, clothing and miscellaneous items respectively on one hand, and total expenditure per head, the prices of the four groups, and time on the other hand. The influence of time represents shifts in demand, or changes which cannot be satisfactorily explained by movements in income and prices; such changes may be very important and may account for a considerable part of the total variations in demand.

The main basic data are those given in Table IV (p. 19) of *National Income and Expenditure 1956-57*, viz. items 23b, 23a, 23c, and all other components of item 23 together respectively. The data refer to the nine financial years from 1948-49 to 1956-57. Figures for the mean population of financial years, given in the Demography Bulletins, have been used to reduce the totals to averages per head. The group indices of the "C" Series Retail Price Index for the capital cities, in the form given in the "Monthly Review of Business Statistics"—reduced to base period 1936-39 = 1000—have been used to indicate prices. For 1955-56 and 1956-57, two alternative indices for food have

been published, and both have been used alternatively in the present analysis. The index including potatoes and onions was then found to give a better fit, though the difference is not large; all the results given here are based on this variant of the index.

Nine years, of course, represent rather few observations on which to base a demand analysis. This is to some extent counterbalanced by the fact that real expenditure per head did not increase steadily over the period but was subject to quite large fluctuations. This feature, which is associated with the dependence of the Australian economy on wool prices, may be economically undesirable but presents advantages to the econometrician.

Even so, it is clear that some restrictive assumptions have to be made. In the first place, it would be quite unrealistic to expect that, with the available material, the best mathematical form of the relationship could be determined. A simple and convenient assumption is that of linearity. The demand functions can then be written in the form

$$v_i = \bar{v}_i + b_i\ (m - \bar{m}) + \sum_{j=1}^{4} c_{ji}\left(\frac{p_j}{\bar{p}_j} - 1\right) + d_i t \qquad (i = 1, 2, 3, 4)$$

where v_i represents expenditure per head on a commodity group (1: food, 2: housing, 3: clothing, 4: miscellaneous); m total expenditure per head; p_i the price index for the group; $\bar{v}_i$, $\bar{m}$, $\bar{p}_i$ means over the period; t time (with mean 0); b_i, c_{ji}, d_i constants.

This would mean four linear regression equations, each with the same six independent variables. The only restrictions on the regression coefficients, which are automatically satisfied when least-square methods are used, would be that, since $\sum_{i=1}^{4} v_i = m$,

$$\sum_{i=1}^{4} b_i = 1;\quad \sum_{i=1}^{4} c_{ji} = 0\ (j = 1, 2, 3, 4);\quad \sum_{i=1}^{4} d_i = 0.$$

An attempt to derive, by multiple regression analysis, six partial regression coefficients for each equation from these few observations could not be justified. Additional assumptions should therefore be made. Before doing this, it is worth while looking at the meaning of the constants.

Write $w_i = \frac{v_i}{m}$ so that w_i represents the proportion of total outlay devoted to each commodity group $\left(\sum_{i=1}^{4} w_i = 1\right)$, and $\bar{w}_i = \frac{\bar{v}_i}{\bar{m}}$. It is then easily seen that $\frac{b_i}{\bar{w}_i}$ represents the income-elasticity of demand for, or of expenditure on, commodity group i at average level, i.e. at average income and average prices and with $t = 0$. Similarly, $\frac{c_{ii}}{\bar{v}_i}$ represents,

at average level, the direct price-elasticity of expenditure, $\frac{\overline{c_{ii}}}{\overline{v_i}} - 1$ the direct-price-elasticity of demand for commodity group i. $\frac{\overline{c_{ji}}}{\overline{v_i}}$ represents the cross price-elasticity of demand or expenditure for commodity group i with regard to a price change for group j. Indicating elasticities of demand by $\frac{Ex_i}{Em}$ and $\frac{Ex_i}{Ep_j}$ and their values at average level by $\frac{\overline{Ex_i}}{Em}$ and $\frac{\overline{Ex_i}}{Ep_j}$, we have

$$\frac{\overline{Ex_i}}{Em} = \frac{b_i}{\overline{w_i}}, \quad \frac{\overline{Ex_i}}{Ep_i} = \frac{\overline{c_{ii}}}{\overline{v_i}} - 1, \quad \frac{\overline{Ex_i}}{Ep_j} = \frac{\overline{c_{ji}}}{\overline{v_i}} \quad (j \neq i)$$

The elasticities of substitution σ_{ji} are defined by the relation

$$\frac{Ex_i}{Ep_j} = -w_j \frac{Ex_i}{Em} + w_j \sigma_{ji}$$

$$\text{or} \quad \sigma_{ji} = \frac{1}{w_j} \frac{Ex_i}{Ep_j} + \frac{Ex_i}{Em}$$

Again denote by $\overline{\sigma_{ji}}$ the value obtained at average level. Then

$$\overline{\sigma_{ii}} = \frac{1}{\overline{w_i}} \left(\frac{\overline{c_{ii}}}{\overline{v_i}} + b_i - 1 \right), \quad \overline{\sigma_{ji}} = \frac{1}{\overline{w_i}} \left(\frac{\overline{c_{ji}}}{\overline{v_j}} + b_i \right) \qquad (j \neq i)$$

$$\text{or} \quad \overline{c_{ii}} = \overline{v_i} \, (\overline{w_i} \, \overline{\sigma_{ii}} - b_i + 1), \quad \overline{c_{ji}} = \overline{v_j} \, (\overline{w_i} \, \overline{\sigma_{ji}} - b_i) \qquad (j \neq i)$$

The demand functions can thus be written in the form

$$v_i - \overline{v_i} \, \pi_i - \overline{w_i} \sum_{j=1}^{4} \overline{v_j} \, \overline{\sigma_{ji}} \, (\pi_j - 1) = b_i m^1 + d_i t$$

$$\text{where} \quad \pi_i = \frac{p_i}{\overline{p_i}}, \quad m^1 = m - \sum_{i=1}^{4} \overline{v_i} \, \pi_i \qquad (\overline{m^1} = 0)$$

In this equation, π_i represents the price relative to its average over the period (not multiplied by 100 or 1,000 as in index numbers). m^1 is an indicator of real total outlay; it is the difference between actual total outlay and the amount necessary to purchase average quantities at current prices.

According to the theory of consumers' demand, $\sigma_{ij} = \sigma_{ji}$ and $\sum_{j=1}^{4} w_j \sigma_{ij} = 0$. But this is not sufficient for the present purpose; a simple assumption is needed which will reduce the regression equation to one containing two independent variables only. A simple possibility would consist in taking, at average level, all cross elasticities of substitution as equal, that is to say

$$\overline{\sigma_{ij}} = \sigma \qquad (i = 1, 2, 3, 4; \quad j \neq i)$$

It follows then that

$$\overline{\sigma_{ii}} = - \frac{(1 - \overline{w_i}) \, \sigma}{\overline{w_i}}$$

In particular, we might make one of the following assumptions:
Either $\sigma = 0$, and $\overline{\sigma_{ii}} = 0$

or $\sigma = 1$, and $\sigma_{ii} = -\dfrac{(1 - \overline{w_i})}{\overline{w_i}}$

or $\sigma = \frac{1}{2}$, and $\overline{\sigma_{ii}} = -\dfrac{(1 - \overline{w_i})}{2\overline{w_i}}$

The meaning of the assumption $\sigma = 0$ is as follows: There is no substitution between commodity groups, and a price change influences the expenditure pattern only through the income effects, the magnitude of which is proportionate to the importance of the group experiencing the price change and to the income-elasticity of the group with the effect of which one is concerned. If a commodity group rises in price, more is spent on it, and outlay on all groups is reduced proportionately to their income-elasticities; if the price rise is compensated by higher income and total outlay, the monetary expenditure pattern changes but the quantities are not affected. All this applies exactly at average level only, but approximately at other levels as well.

The assumption $\sigma = 1$, on the other hand, implies that, apart from the income effect, the money pattern of expenditure is not affected by price changes. If the income effect of a price rise is compensated by a corresponding rise in total outlay, the consumption of the commodity group rising in price is reduced in real terms, and the consumption of other groups increases, so as to leave the distribution of outlay constant. The reduction may be brought about partly by smaller quantities of all commodities in the group being bought, partly by substitution of lower-priced for higher-priced items; and similarly for an increase in consumption. This hypothesis, if satisfied, would be statistically very convenient, for it would mean that prices enter into the demand function in an aggregate only and not individually, which would simplify the equation. It will, however, be shown that the assumption cannot be considered as realistic.

The assumption $\sigma = \frac{1}{2}$ is simply a compromise between the two extremes. Each of these three assumptions was tested by solving the regression equations with the least-square method on its basis. On the whole, the model with $\sigma = \frac{1}{2}$ was found to be most satisfactory, in the sense that it leaves least of the variation in expenditure per head on the commodity groups unexplained. The exception is rent, for which the model with $\sigma = 0$ gives a considerably better fit.

It was then finally decided to use a mixed model in which

$$\sigma_{ij} = \begin{cases} 0 & \text{for } i = 2,\ j \neq 2 \text{ or } i \neq 2,\ j = 2 \\ \frac{1}{2} & \text{for } i \neq 2,\ j \neq 2,\ j \neq i \end{cases}$$

and thus $\sigma_{22} = 0$

$$\sigma_{ii} = \frac{-(1 - \overline{w_2} - \overline{w_i})}{2\overline{w_i}} \qquad (i \neq 2)$$

There is a sound theoretical justification for the hypothesis. Expenditure on housing, particularly with regard to owner-occupied

houses, is planned on a long-term basis and cannot be quickly adjusted in response to short-term price movements; hence no appreciable substitution between housing and other commodity groups is likely in the short run. This, however, implies that the change in housing expenditure in response to income changes, or the income-elasticity of demand for housing, obtained here refers to short-term effects only. Long-term effects of relative prices are included in the trend, i.e. the effect of time, and cannot be isolated from other changes over time.

Having fixed upon the model, it is a simple matter to derive the constants b_i and d_i by multiple regression analysis. Since m^1 and t are not highly correlated, the effects of income and time can be isolated with some confidence. In the case of each commodity group, the introduction of time is found to improve the fit considerably over that which is a simple regression on m^1 would give.

From the results, the effects of price changes, or the price-elasticities of demand, may also be calculated. It must, however, be borne in mind that neither direct nor cross price-elasticities are estimated independently of the income-elasticities, and the results obtained for them are very much influenced by the underlying assumptions made for the elasticities of substitution. On the other hand, the income-elasticities of demand are, on the whole, little affected by these assumptions. This is so because they are, broadly speaking, obtained from changes in real income per head, which are relatively large, whilst the price-elasticities would be estimated from differentials in price movements, which are comparatively small.

2. *Results Based on Total Expenditure*

The resulting demand functions can be written as follows:

$$v_1 = 75{\cdot}91 + {\cdot}1953\ (m - 288{\cdot}3) + 36{\cdot}01\left(\frac{p_1}{2{,}654} - 1\right) - 4{\cdot}28\left(\frac{p_2}{1{,}210} - 1\right) - 2{\cdot}62\left(\frac{p_3}{3{,}482} - 1\right) - 9{\cdot}50\left(\frac{p_4}{1{,}929} - 1\right) - {\cdot}74t$$

$$v_2 = 21{\cdot}93 + {\cdot}0106\ (m - 288{\cdot}3) - {\cdot}81\left(\frac{p_1}{2{,}654} - 1\right) + 21{\cdot}69\left(\frac{p_2}{1{,}210} - 1\right) - {\cdot}44\left(\frac{p_3}{3{,}482} - 1\right) - 1{\cdot}59\left(\frac{p_4}{1{,}929} - 1\right) + 1{\cdot}04t$$

$$v_3 = 41{\cdot}12 + {\cdot}1959\ (m - 288{\cdot}3) - 9{\cdot}45\left(\frac{p_1}{2{,}654} - 1\right) - 4{\cdot}29\left(\frac{p_2}{1{,}210} - 1\right) + 17{\cdot}01\left(\frac{p_3}{3{,}482} - 1\right) - 18{\cdot}60\left(\frac{p_4}{1{,}929} - 1\right) - 1{\cdot}17t$$

$$v_4 = 149{\cdot}36 + {\cdot}5982\ (m - 288{\cdot}3) - 25{\cdot}75\left(\frac{p_1}{2{,}654} - 1\right)$$

$$-13\cdot12\left(\frac{p_2}{1{,}210}-1\right)-13\cdot95\left(\frac{p_3}{3{,}482}-1\right)$$
$$+29\cdot69\left(\frac{p_4}{1{,}929}-1\right)+\cdot87t$$

Herein $p_i = 1{,}000$ for 1936-39 $(i = 1, 2, 3, 4)$
$t = 0$ for 1952/53 and measured in years, thus ranging from -4 to $+4$ over the period studied.
v_i and m measured in £.

The equations can also be written in another form:

$$v_1 = \cdot1953m + 13\cdot56\,\frac{p_1}{1{,}000} - 3\cdot54\,\frac{p_2}{1{,}000} - \cdot75\,\frac{p_3}{1{,}000}$$
$$-4\cdot93\,\frac{p_4}{1{,}000} - \cdot74t$$

$$v_2 = \cdot0106m - \cdot30\,\frac{p_1}{1{,}000} + 17\cdot93\,\frac{p_2}{1{,}000} - \cdot13\,\frac{p_3}{1{,}000}$$
$$-\cdot82\,\frac{p_4}{1{,}000} + 1\cdot04t$$

$$v_3 = \cdot1959m - 3\cdot56\,\frac{p_1}{1{,}000} - 3\cdot55\,\frac{p_2}{1{,}000} + 4\cdot89\,\frac{p_3}{1{,}000}$$
$$-9\cdot65\,\frac{p_4}{1{,}000} - 1\cdot17t$$

$$v_4 = \cdot5982m - 9\cdot70\,\frac{p_1}{1{,}000} - 10\cdot84\,\frac{p_2}{1{,}000} - 4\cdot01\,\frac{p_3}{1{,}000}$$
$$+15\cdot40\,\frac{p_4}{1{,}000} + \cdot87t.$$

The fact that the constant terms in these equations are all nil, or strictly speaking negligible, is accidental. We also have $\overline{w}_1 = \cdot2633$, $\overline{w}_2 = \cdot0760$, $\overline{w}_3 = \cdot1426$, $\overline{w}_4 = \cdot5181$.

These results are interpreted as follows: On the average over the period 1948-57, expenditure per head was £288.6s., of which £75.18s., or 26·3 per cent, went on food; £21.19s., or 7·6 per cent, on housing; £41.2s., or 14·3 per cent, on clothing; £149.7s., or 51·8 per cent, on miscellaneous items. At the margin of total outlay, expenditure was distributed as follows: 19·5 per cent on food, 1·1 per cent on housing, 19·6 per cent on clothing, 59·8 per cent on miscellaneous items. As stated above, the figure for housing represents short-term effects only. An increase in price of any group brought about a higher outlay on that group and a lower outlay on all others. For example, an increase in food prices by 265 points, which is 10 per cent of the average price index level, implies that £3.12s. more is spent on food, 2s. less on housing, 19s. less on clothing and £2.11s. less on miscellaneous items. Furthermore, apart from price and income changes, food expenditure tended to decrease by 15s., housing expenditure to increase by £1.1s., clothing expenditure to decrease by £1.3s.6d. and miscellaneous expenditure to increase by 17s.6d. each year.

At average income and price level, the following values are obtained for the income-elasticities of demand:

$$\frac{\overline{Ex_1}}{\overline{Em}} = \cdot 74; \frac{\overline{Ex_2}}{\overline{Em}} = \cdot 14; \frac{\overline{Ex_3}}{\overline{Em}} = 1 \cdot 37; \frac{\overline{Ex_4}}{\overline{Em}} = 1 \cdot 15.$$

Clothing thus appears to have the highest income-elasticity of demand, but the demand for miscellaneous items is also elastic, that for food is inelastic and that for rent very inelastic, apart from long-term effects included in the trend. This is the sort of result one might have expected to find; and indeed, the analysis may merely have—as economics and economic statistics is often alleged to do—"started from false premises and reached foregone conclusions"!

For the average price-elasticities $\frac{\overline{Ex_i}}{\overline{Ep_j}}$ the following values are obtained:

i	$j=1$	2	3	4
1	—·53	—·06	—·03	—·12
2	—·04	—·01	—·02	—·07
3	—·23	—·10	—·59	—·45
4	—·17	—·09	—·09	—·80

As pointed out before, too much weight should not be given to these latter results, but if they are correct, the demand for each commodity group is inelastic with regard to changes in its price, and that for housing particularly so. Any price rise in one group causes outlay on each of the other groups to fall.

In order to assess the reliability of the results obtained here, the unexplained portion of the variation in consumption per head for each commodity group may be considered, first as a percentage of the variation in the dependent variable in the regression—the proportion is then $1 - R^2$, where R is the multiple correlation coefficient—and secondly as a percentage of the variation in the original variable v_i which still contains the effect of price changes. The results indicate a very good fit and are as follows:

	Food	*Housing*	*Clothing*	*Miscellaneous*
Unexplained variance in % of variance in:				
transformed variable	9·29	·98	2·74	1·30
original variable	·22	·27	·82	·09

Furthermore, it is of interest to consider the effect of alternative assumptions upon the results. It goes without saying that the results obtained for price-elasticities depend very much upon the assumptions made for substitution elasticities; but this does not necessarily apply to the results for income-elasticities and trends. In the four models studied here, the range within which the results—in each case derived by multiple regression on the income variable and time—vary is as follows:

	Food	*Housing*	*Clothing*	*Miscellaneous*
Income elasticity of demand at average level	·57 to ·74	·14 to 1·36	1·27 to 1·38	1·09 to 1·15
Annual change in expenditure per head, other things equal	— £1.10s.6d. to + 8s.6d.	+ 4s.0d. to + £1.1s.0d.	— £1.6s.6d. to — 18s.6d.	+ 14s.0d. to + £1.8s.0d.

The resulting income-elasticities of demand for food, clothing and miscellaneous items are seen to vary very little. Only for housing, the income-elasticity would be sensibly affected by the assumption; but using alternative models, the fit would become much worse, since the model $\sigma_{ij} = \frac{1}{2}$ would leave 2·21 per cent, and the model $\sigma_{ij} = 1$ even 6·47 per cent of the total variation unexplained instead of ·27 per cent. The model based on $\sigma_{ij} = 0$ would also be inferior with regard to the fit, particularly in the clothing group, where 2·37 per cent instead of ·82 per cent of the variance would be unexplained. This justifies the retention of the chosen model and the placing of a fair degree of reliance upon the numerical results regarding the income effects. The results for the trend are not quite so stable, in particular the trend for food seems somewhat uncertain; but the trend for housing and miscellaneous items is always positive, that for clothing always negative, no matter which assumption is made.

An arbitrary assumption made with regard to the income-elasticities, combined with the derivation by least squares of the linear trend, would also imply a considerably poorer fit. For example, if in addition to the assumption $\sigma_{ij} = \begin{Bmatrix} 0 \\ \frac{1}{2} \end{Bmatrix}$ the assumption $\frac{\overline{Ex_i}}{\overline{Em}} = 1 \ (i = 1, 2, 3, 4)$ is introduced, the unexplained portion of the variation for housing is made almost nine times larger. The assumption $\frac{\overline{Ex_i}}{\overline{Em}} = \begin{Bmatrix} 0 & i = 2 \\ 1 & i \neq 2 \end{Bmatrix}$ would not greatly affect the fit for housing and miscellaneous items, but the unexplained variation would be nearly doubled for clothing and nearly trebled for food. This feature offers further support for the thesis that the demand functions obtained here are fundamentally reliable.

3. *Relations between Income and Expenditure*

It is easy to transform the equations derived for expenditure per head into equations for expenditure by all consumers. If V_i represents consumption expenditure on each commodity group, M total consumption expenditure (all measured in £ million) and P population (in millions), we have:

$$V_1 = \cdot 1953M + P\left(13 \cdot 56 \frac{p_1}{1{,}000} - 3 \cdot 54 \frac{p_2}{1{,}000} - \cdot 75 \frac{p_3}{1{,}000} - 4 \cdot 93 \frac{p_4}{1{,}000} - \cdot 74t\right)$$

$$V_2 = \cdot 0106M + P\left(- \cdot 30 \frac{p_1}{1{,}000} + 17 \cdot 93 \frac{p_2}{1{,}000} - \cdot 13 \frac{p_3}{1{,}000} - \cdot 82 \frac{p_4}{1{,}000} + 1 \cdot 04t\right)$$

$$V_3 = \cdot 1959M + P\left(-3 \cdot 56 \frac{p_1}{1{,}000} - 3 \cdot 55 \frac{p_2}{1{,}000} + 4 \cdot 89 \frac{p_3}{1{,}000} - 9 \cdot 65 \frac{p_4}{1{,}000} - 1 \cdot 17t\right)$$

$$V_4 = \cdot 5982M + P\left(-9\cdot 70\frac{p_1}{1{,}000} - 10\cdot 84\frac{p_2}{1{,}000} - 4\cdot 01\frac{p_3}{1{,}000} + 15\cdot 40\frac{p_4}{1{,}000} + \cdot 87t\right)$$

The question now arises: Can M itself be predicted on the basis of some indicator for income? H. W. Arndt and B. Cameron suggest that it can be done on the basis of non-farm disposable income.* This hypothesis should now be examined.

Total consumption expenditure may be considered as a linear function of total disposable income, or of non-farm and of farm disposable income. The validity of this model may be queried on theoretical grounds, for it implicitly assumes that prices and population size do not affect the decision by the nation how much to save and how much to spend altogether. It is, however, a convenient model. There is also a practical objection against using such an equation for estimating the respective influence of non-farm and farm income; for the result will be heavily influenced by the long-term increase in money income over the period, which largely reflects population growth and price rises.

The second, though not the first, objection is met by estimating the regression coefficients from the equation

$$\frac{M}{I} = a + b\frac{N}{I} + \frac{c}{I}$$

where I denotes total, N non-farm disposable income. If F stands for farm disposable income so that $N + F = I$, the equation can be written as

$$M = aI + bN + c = (a + b)\,N + aF + c$$

Data for I can be obtained from Table IV (p. 19) of *National Income and Expenditure 1956-57* by deducting item 13b—income taxes—from total income or outlay. Strictly speaking, estate and gift duties should also be deducted, but this is a minor item. Data for N represent revised estimates of the figures given in Table I (p. 110) of "An Australian Consumption Function".

Applying the method of least squares to the equation in its first form, the finding is that

$$\frac{M}{I} = \cdot 99768\frac{N}{I} + \frac{148\cdot 8}{I} - \cdot 07178$$

About 95 per cent of the variation in $\frac{M}{I}$ is explained by the regression. This means that it is certainly better to use non-farm and farm income separately than combined, in order to explain variations in consumption expenditure.

Rewritten, the equation would become

$$M = 148\cdot 8 + \cdot 9259\,N - \cdot 0718\,F$$

* H. W. Arndt and B. Cameron, "An Australian Consumption Function", *Economic Record*, Vol. 33, No. 64, April 1957.

This would seem to imply that other things being equal, consumption expenditure falls slightly when farm disposable income rises. Since this is not plausible and in any case the effect of variations in farm disposable income is small, it seems justifiable to replace the last term by a constant, obtained by substituting the average value of F over the period amounting to 399. The consumption function then assumes the form

$$M = 120{\cdot}2 + {\cdot}9259\,N$$

This expression may be substituted for M in the equations relating V_i to M, P, p_1, p_2, p_3, p_4 and t.

It is of interest to see how closely the calculated values for V_1, V_2, V_3 and V_4 approximate the actual values. The calculation can be made on the basis of (a) actual total consumption expenditure, or (b) non-farm disposable income. In either case the price indices as given in the *Monthly Review of Business Statistics* are used, and t assumes successively the values -4, -3, ..., $+4$. The results are as follows:

Year		Expenditure on:				
		Food	Housing	Clothing	Miscellaneous	All Groups
1948/49:	Actual	381	121	239	731	1,472
	Calculated (a)	378	116	238	740	1,472
	(b)	375	116	235	731	1,457
1949/50:	Actual	430	129	265	848	1,672
	Calculated (a)	423	129	269	851	1,672
	(b)	423	130	270	853	1,676
1950/51:	Actual	512	142	330	1,047	2,031
	Calculated (a)	518	145	322	1,046	2,031
	(b)	516	145	319	1,038	2,018
1951/52:	Actual	635	158	353	1,245	2,391
	Calculated (a)	649	161	358	1,223	2,391
	(b)	652	161	361	1,233	2,407
1952/53:	Actual	698	186	356	1,298	2,538
	Calculated (a)	691	187	355	1,305	2,538
	(b)	699	187	363	1,329	2,578
1953/54:	Actual	747	211	389	1,455	2,802
	Calculated (a)	752	211	388	1,451	2,802
	(b)	754	211	390	1,458	2,813
1954/55:	Actual	812	236	423	1,625	3,096
	Calculated (a)	808	236	429	1,623	3,096
	(b)	805	236	427	1,615	3,088
1955/56:	Actual	883	264	441	1,739	3,327
	Calculated (a)	878	263	442	1,744	3,327
	(b)	878	263	442	1,745	3,328
1956/57:	Actual	923	294	448	1,864	3,529
	Calculated (a)	925	292	443	1,869	3,529
	(b)	918	292	435	1,847	3,492

The fit seems satisfactory, though of course it cannot be as good when based on non-farm disposable income as when total consumption expenditure is used. The demand functions thus seem to give a good, if broad, description of what has happened to consumption in Australia since the immediate post-war years.

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CAPITAL, INCOME AND OUTPUT IN NEW ZEALAND AGRICULTURE 1922–1956*

1. *Introduction*

Since agriculture is such an important sector of the New Zealand economy, it is surely surprising that there exist no official or unofficial estimates of net farm incomes for the interwar period, nor of net productivity in agriculture for any period at all. This article is an attempt to fill this gap in our statistics by presenting some estimates of capital, net income, and net output in farming, which were derived by the authors as the by-product of a larger study of time-series production functions and supply functions for New Zealand agriculture. In deriving these estimates, considerable care has been taken to check the results by using as many different methods as possible. While, we consider, therefore, that they are the best estimates that can at present be secured from the available raw data, we are only too well aware of their imperfections and it is to be hoped that they will form the basis for informed criticism leading eventually to more detailed research and improved results.

Full details of the calculations and of the estimating procedures adopted are being published as a separate monograph available from the authors on request. In this article we give only the final estimates of capital, income, and output together with a very broad indication of the methods used. Throughout the tables which follow, all data given in real terms have been expressed in 1949/50 prices. The year 1949/50 was chosen as base year because in New Zealand it was a post-war year of reasonable internal and external stability, it was free from complications such as the 1948 appreciation of the New Zealand exchange rate and the 1950/51 wool boom, and lastly it was the year in which occurred the latest census of agriculture.

2. *Real Capital Employed in New Zealand Agriculture*

Table I gives the final estimates of real capital divided into livestock, plant and machinery, and improvements to land. Little difficulty was experienced in deriving the value of livestock but some comments are necessary here on the methods used for estimating plant and machinery and improvements.

(a) *Plant and Machinery*

The method used was to commence with the depreciated value, in 1949/50 prices, of the plant and machinery on farms as reported in

* The Senior Author of this article is Statistician of the New Zealand Meat and Wool Boards' Economic Service, but the views expressed are personal. Grateful acknowledgement must be made however for the advice and encouragement received from colleagues in the Economic Service.

the 1949/50 Census of Agriculture. This base year figure was then extended backwards and forwards using a series of real net investment in plant and machinery. This in turn was derived, after allowing for depreciation, from a gross investment series built up from the official statistics of local production and imports of farm plant and machinery deflated by a specially constructed index of farm machinery prices.

TABLE I

Value of Total Real Capital on New Zealand Farms

Year	(1) Livestock	(2) Plant Machinery	(3) Improvements	(4) Total
		£000 (1949/50 Prices)		
1920/21	107,938	12,539	178,950	299,427
1921/22	109,214	14,680	177,341	301,235
1922/23	108,969	15,716	178,940	303,625
1923/24	112,399	17,639	180,009	310,047
1924/25	113,315	20,107	184,219	317,641
1925/26	114,575	22,312	200,799	337,686
1926/27	112,688	23,918	213,223	349,829
1927/28	114,990	24,378	234,017	373,385
1928/29	121,191	25,065	239,369	385,625
1929/30	130,644	26,925	250,026	407,595
1930/31	139,162	27,775	259,242	426,179
1931/32	136,529	27,127	270,737	434,393
1932/33	135,807	27,017	278,910	441,734
1933/34	135,310	27,448	287,514	450,272
1934/35	137,736	27,732	298,590	464,058
1935/36	138,351	29,040	304,651	472,042
1936/37	142,950	31,557	304,867	479,374
1937/38	147,547	33,694	300,959	482,240
1938/39	150,894	35,313	295,435	481,642
1939/40	149,288	35,581	294,780	479,649
1940/41	148,026	36,028	294,087	478,141
1941/42	150,493	35,924	293,038	478,455
1942/43	149,113	34,304	291,070	474,487
1943/44	150,102	35,004	290,052	475,158
1944/45	153,646	37,672	289,818	481,136
1945/46	156,587	39,541	291,110	487,238
1946/47	154,466	42,975	294,490	491,931
1947/48	154,092	45,512	299,740	499,344
1948/49	153,684	49,842	306,343	509,869
1949/50	158,010	51,881	314,567	524,458
1950/51	162,234	54,678	322,641	539,553
1951/52	166,132	57,914	329,146	553,192
1952/53	171,783	60,774	357,344	589,901
1953/54	178,602	61,682	379,354	619,638
1954/55	185,373	64,034	418,553	667,960

(b) *Improvements to Land*

This series is derived from the published statistics of the value of improvements in the Government valuations of rural counties. These have been deflated by a specially constructed index of the cost of improvements thus giving the value of improvements at depreciated 1949/50 replacement cost.

The rationale underlying this procedure is that it is general practice for improvements to be valued at depreciated replacement cost, but it must at once be conceded that our method suffers from the following imperfections.[1]

First, in periods of rapid change in the prices of primary products, when open market land values were rising or falling in sympathy, it is likely that the full effect was reflected by Government valuers not as it should have been in changes in unimproved value only, but also in changes in the value of improvements. For this reason it is likely that the published value of improvements is too low in the 1930 period and too high for the years since 1951. It is not possible however to measure the magnitude of this effect.

A second difficulty is that the annual valuation figures as published are not the result of an *annual* revaluation of every county. It is more likely that at the least each county has been revalued only about once every five years. The annual figures can therefore only be relied upon to give an accurate estimate of changes in the value of improvements for all rural counties, in periods when the rate of investment in improvements in all counties is proceeding at the same rate as in the counties which are in fact being revalued. This means that the series gives a somewhat distorted picture in periods when investment in improvements was not proceeding uniformly throughout the country or when investment in improvements was in general slowing down or speeding up. For these reasons it would be unwise to rely too much on the figures as an indicator of annual investment in improvements, even though they are quite suitable as an indicator of the general trends in the capital employed in the form of improvements.

3. *Factor Incomes in Farming and Net Farm Output*

Our conceptual approach in calculating farm income and productivity is that of national income accounting. In this approach farming is regarded as a separate industry employing and paying factors of production, and also purchasing goods and services from other industries, which purchases form some part of the gross output of those other industries. In order to arrive then at the net contribution made by agriculture to the national income, a deduction from gross output must be made for these purchases both when dealing in terms of current prices and constant prices. The residual, found after making such a deduction, equals the total rewards paid to the factors of production whether owned or hired by the farmer. In constant prices it represents the true net productivity of agriculture.

Tables II and III give our completed estimates of income and expenses in current prices and in 1949/50 prices. We begin by defining the terms used in these tables.

1. An excellent appraisal of this whole question of using official valuation figures to derive estimates of investment in improvements, is to be found in G. O. Gutman: "Investment and Production in Australian Agriculture", *Review of Marketing and Agricultural Economics*, Vol. 23, No. 4, pp. 253-273.

TABLE II

Gross Income, Expenditure and Net Income on New Zealand Farms 1921-1956

£,000—Current Prices

Year ended 30th June

ITEM	1921/22	1922/23	1923/24	1924/25	1925/26	1926/27	1927/28	1928/29	1929/30	1930/31	1931/32	1932/33
1. Non Factor Expenses												
2. Farm Requisites	1,281	1,139	1,390	1,410	1,579	1,410	1,365	1,421	1,444	1,359	1,083	1,092
3. Fertiliser	354	463	641	879	1,272	1,284	1,465	1,731	1,921	1,550	1,347	1,491
4. Lime	142	152	220	241	226	231	240	239	248	240	196	198
5. Seeds (imported)	204	128	239	280	209	264	163	212	224	164	88	117
6. Fuel, Oil and Grease	105	91	101	180	296	340	398	352	415	492	493	558
7. Electricity and Power	434	435	452	463	485	502	541	493	616	692	708	741
8. Repairs and Maintenance:												
(i) Buildings, Fences and Structures	1,910	1,640	1,549	1,650	1,748	1,828	2,004	2,058	2,143	2,219	2,165	2,094
(ii) Plant and Machinery	638	663	718	845	975	1,073	1,139	1,164	1,240	1,285	1,243	1,196
9. Railage and Cartage	1,426	1,242	1,111	1,127	1,089	1,117	1,262	1,233	1,297	1,314	1,296	1,509
10. Depreciation:												
(i) Buildings and Structures	902	912	918	943	1,049	1,111	1,230	1,260	1,320	1,372	1,434	1,479
(ii) Plant and Machinery	309	368	398	454	530	602	662	688	718	779	808	811
11. Other Expenses	6,996	6,831	7,067	7,841	8,350	7,641	7,257	7,101	6,719	6,291	5,467	4,591
12. Total Non Factor Expenses	14,701	14,064	14,804	16,313	17,808	17,403	17,726	17,952	18,305	17,757	16,328	15,877
13. Factor Expenses												
14. Wages	7,980	7,733	8,160	8,130	7,493	8,086	8,927	10,098	10,406	10,556	8,860	6,089
15. Interest	7,355	7,752	8,054	8,401	8,695	8,770	9,034	9,217	9,603	9,824	9,745	9,558
16. Rent	2,841	2,795	2,823	2,767	2,744	2,734	2,689	2,681	2,688	2,399	2,393	2,203
17. Rates	1,557	1,792	1,837	1,959	2,092	2,111	2,229	2,238	2,231	1,839	1,737	1,470
18. Land Tax	1,638	1,541	1,426	1,335	1,267	1,229	1,154	1,140	1,507	1,146	542	499
19. Total Factor Expenses	21,371	21,613	22,300	22,592	22,291	22,930	24,033	25,374	26,435	25,764	23,277	19,819
20. Total Expenses(*a*)	36,100	35,700	37,100	38,900	40,100	40,300	41,800	43,300	44,700	43,500	39,600	35,700
21. Net Farm Income(*a*)	13,400	17,500	16,300	26,500	14,900	13,900	20,700	25,300	16,500	0·0	—1,700	2,300
22. Gross Farm Income(*a*)	49,500	53,200	53,400	65,400	55,000	54,200	62,500	68,600	61,200	43,500	37,900	38,000

(*a*) Rounded to nearest hundred thousand.
(*b*) Provisional estimates.

(b) Provisional estimates.

TABLE II—*continued*

ITEM	1933/34	1934/35	1935/36	1936/37	1937/38	1938/39	1939/40	1940/41	1941/42	1942/43	1943/44	1944/45
1. Non Factor Expenses												
2. Farm Requisites	1,282	1,347	1,383	1,322	1,544	1,466	1,559	1,949	1,724	1,651	2,056	2,667
3. Fertiliser	1,464	1,449	1,520	1,832	2,268	2,225	2,634	2,771	2,103	1,680	1,613	2,091
4. Lime	204	231	269	321	370	378	377	512	566	668	724	727
5. Seeds (imported)	109	138	134	127	173	130	160	207	109	89	127	185
6. Fuel, Oil and Grease	646	651	718	828	990	1,084	1,296	1,689	1,503	2,079	2,217	2,384
7. Electricity and Power	716	697	730	761	808	850	890	945	966	973	985	990
8. Repairs and Maintenance:												
(i) Buildings, Fences and Structures	2,263	2,346	2,425	2,595	2,937	3,074	3,055	3,375	3,652	3,749	3,900	3,926
(ii) Plant and Machinery	1,134	1,190	1,272	1,520	1,888	2,098	2,188	2,255	2,253	2,442	2,632	2,775
9. Railage and Cartage	1,580	1,492	1,582	1,670	1,718	1,657	1,812	2,147	1,968	2,107	2,098	2,288
10. Depreciation:												
(i) Buildings and Structures	1,524	1,583	1,613	1,615	1,593	1,561	1,557	1,552	1,545	1,531	1,523	1,522
(ii) Plant and Machinery	833	858	886	951	1,073	1,212	1,347	1,413	1,483	1,539	1,514	1,634
11. Other Expenses	4,202	3,877	4,396	5,416	6,612	7,376	9,561	12,226	14,401	18,140	21,710	24,297
12. Total Non Factor Expenses	15,957	15,859	16,928	18,958	21,974	23,111	26,436	31,041	32,273	36,648	41,099	45,486
13. Factor Expenses												
14. Wages	5,428	5,548	6,210	9,394	12,134	12,829	12,438	10,659	8,671	9,586	11,090	11,810
15. Interest	7,412	7,416	7,396	7,421	7,373	7,253	7,254	7,142	7,045	6,794	6,540	6,446
16. Rent	2,281	2,302	2,323	2,302	2,290	2,280	2,277	2,230	2,233	2,220	2,207	2,200
17. Rates	1,701	1,595	1,664	1,898	2,159	2,269	2,356	2,416	2,415	2,495	2,504	2,513
18. Land Tax	499	493	459	1,048	1,038	1,058	1,019	959	1,009	976	988	953
19. Total Factor Expenses	17,321	17,354	18,052	22,063	24,994	25,689	25,344	23,406	21,373	22,071	23,329	23,922
20. Total Expenses(*a*)	33,300	33,200	35,000	41,000	47,000	48,800	51,800	54,400	53,600	58,700	64,400	69,400
21. Net Farm Income(*a*)	16,300	13,400	24,000	33,600	24,100	21,800	24,000	31,300	31,200	27,100	23,300	34,300
22. Gross Farm Income(*a*)	49,600	46,600	59,000	74,600	71,100	70,600	75,800	85,700	84,800	85,800	87,700	103,700

TABLE II—*continued*

ITEM	1945/46	1946/47	1947/48	1948/49	1949/50	1950/51	1951/52	1952/53	1953/54	1954/55	1955/56
1. Non Factor Expenses											
2. Farm Requisites	1,745	1,867	3,622	3,102	3,244	2,860	6,142	4,221	3,035	3,602	4,000(*b*)
3. Fertiliser	2,291	2,883	4,937	6,037	5,989	7,181	9,490	8,999	8,232	10,356	11,261
4. Lime	1,036	742	849	946	1,044	1,143	1,176	1,122	1,218	1,443	1,600(*b*)
5. Seeds (imported)	214	310	362	284	189	323	740	205	161	400	722
6. Fuel, Oil and Grease	2,544	2,692	3,124	3,836	4,646	5,606	7,185	8,188	9,007	9,493	10,024
7. Electricity and Power	997	1,032	1,113	1,247	1,416	1,637	1,803	1,918	2,100	2,290	2,331
8. Repairs and Maintenance:											
(i) Buildings, Fences and Structures	4,203	4,692	4,681	5,150	5,348	5,813	7,127	7,968	7,727	9,880	11,755
(ii) Plant and Machinery	3,232	3,399	3,888	4,617	5,276	6,408	7,684	8,265	8,654	9,613	10,000(*b*)
9. Railage and Cartage	2,166	2,220	2,406	2,664	2,800	3,187	3,549	3,941	4,228	4,497	4,740
10. Depreciation:											
(i) Buildings and Structures	1,532	1,562	1,608	1,669	1,746	1,826	1,896	2,216	2,497	3,020	3,896
(ii) Plant and Machinery	1,880	2,093	2,370	2,601	3,083	3,431	4,024	4,726	5,433	5,857	6,321
11. Other Expenses	20,700	17,100	22,400	24,200	38,600	70,100	33,100	63,700	59,300	54,500	48,100
12. Total Non Factor Expenses	42,540	40,592	51,360	56,353	73,381	109,515	83,916	115,469	111,592	114,951	114,750
13. Factor Expenses											
14. Wages	14,137	15,400	16,062	17,573	18,494	20,101	22,947	25,100	26,112	28,356	29,218
15. Interest	6,386	6,552	6,714	6,981	7,178	7,203	7,727	8,772	9,266	10,134	11,317
16. Rent	2,193	2,185	1,998	1,969	2,049	1,965	1,889	1,842	2,417	2,658	2,800(*b*)
17. Rates	2,713	2,913	3,224	3,524	3,865	4,357	5,171	5,389	5,868	6,329	7,000(*b*)
18. Land Tax	937	939	854	916	967	1,043	1,138	1,315	1,615	967	1,228
19. Total Factor Expenses	26,366	27,989	28,852	30,963	32,553	34,669	38,872	42,418	45,278	48,444	51,563
20. Total Expenses(*a*)	68,900	68,600	80,200	87,300	105,900	144,200	122,800	157,900	156,900	163,400	166,300
21. Net Farm Income(*a*)	28,200	43,500	56,300	60,200	79,200	147,400	97,100	104,900	118,500	120,800	118,300
22. Gross Farm Income(*a*)	97,100	112,100	136,500	147,500	185,100	291,600	219,900	262,800	275,400	284,200	284,600

TABLE III

Real Gross Output, Real Inputs and Real Net Output on New Zealand Farms 1921-1956

£,000—1949/50 Prices

Year ended 30th June

ITEM	1921/22	1922/23	1923/24	1924/25	1925/26	1926/27	1927/28	1928/29	1929/30	1930/31	1931/32	1932/33
1. Non Factor Inputs												
2. Farm Requisites	2,111	2,005	2,754	2,516	2,746	2,812	2,737	3,021	3,230	3,136	2,688	2,660
3. Fertiliser	246	483	862	1,091	1,489	1,818	2,102	2,774	2,974	2,376	2,530	2,974
4. Lime	115	142	231	260	251	263	276	277	288	284	233	235
5. Seeds Imported	329	206	395	440	323	411	261	317	359	292	160	248
6. Fuel, Oil and Grease	70	80	119	225	376	486	535	590	662	786	805	855
7. Electricity and Power	481	521	567	589	612	627	675	611	776	875	898	968
8. Repairs and Maintenance:												
(i) Buildings, Structures and Fences	3,029	3,042	3,060	3,132	3,413	3,625	3,978	4,069	4,250	4,407	4,603	4,741
(ii) Plant and Machinery	1,114	1,197	1,347	1,561	1,769	1,920	1,984	2,050	2,202	2,294	2,219	2,243
9. Railage and Cartage	1,408	1,436	1,470	1,515	1,470	1,554	1,719	1,798	1,890	1,912	1,912	2,184
10. Depreciation:												
(i) Buildings and Structures	1,773	1,789	1,800	1,842	2,008	2,132	2,340	2,394	2,500	2,592	2,707	2,789
(ii) Plant and Machinery	765	910	990	1,129	1,307	1,473	1,603	1,658	1,729	1,885	1,972	1,953
11. Other Inputs	10,520	11,558	12,597	13,636	14,675	13,995	13,315	12,635	11,955	11,275	10,595	9,915
12. Total Non Factor Inputs	21,961	23,369	26,192	27,936	30,439	31,116	31,525	32,194	32,815	32,114	31,322	31,775
13. Net Output	70,935	71,374	70,767	71,978	66,520	71,384	81,871	86,373	91,847	94,025	94,817	112,279
14. Gross Output	92,896	94,743	96,959	99,914	96,959	102,500	113,396	118,567	124,662	126,139	126,139	144,054

(*a*) Provisional estimates

TABLE III—*continued*

ITEM	1933/34	1934/35	1935/36	1936/37	1937/38	1938/39	1939/40	1940/41	1941/42	1942/43	1943/44	1944/45
1. Non Factor Inputs												
2. Farm Requisites	2,942	3,318	3,233	3,135	3,561	3,421	3,208	3,779	3,542	2,692	2,723	3,447
3. Fertiliser	2,677	2,818	2,959	3,737	4,468	4,418	4,740	5,049	3,662	2,920	2,574	3,389
4. Lime	235	267	316	382	426	430	427	574	598	679	719	777
5. Seeds Imported	207	252	249	222	296	217	174	351	169	129	181	250
6. Fuel, Oil and Grease	916	976	1,054	1,185	1,360	1,562	1,742	1,875	2,020	2,139	2,290	2,456
7. Electricity and Power	1,008	1,039	1,058	1,075	1,095	1,105	1,125	1,178	1,196	1,194	1,195	1,196
8. Repairs and Maintenance:												
(i) Buildings, Structures and Fences	4,888	5,076	5,179	5,182	5,152	5,107	5,102	5,097	5,088	5,073	5,064	5,063
(ii) Plant and Machinery	2,305	2,356	2,475	2,690	3,025	3,127	3,185	3,206	3,100	3,171	3,400	3,585
9. Railage and Cartage	2,254	2,184	2,299	2,366	2,366	2,276	2,369	2,618	2,526	2,436	2,414	2,618
10. Depreciation:												
(i) Buildings and Structures	2,875	2,987	3,047	3,049	3,010	2,954	2,948	2,941	2,930	2,911	2,901	2,898
(ii) Plant and Machinery	1,972	2,031	2,080	2,207	2,430	2,628	2,790	2,846	2,918	2,948	2,847	2,940
11. Other Inputs	9,235	8,558	9,620	10,682	11,744	12,806	16,343	19,880	23,417	26,954	30,491	34,029
12. Total Non Factor Inputs	31,514	31,862	33,569	35,912	38,933	40,051	44,153	49,394	51,166	53,246	56,799	62,648
13. Net Output	117,157	112,192	117,872	120,146	117,125	110,097	112,090	123,286	115,419	107,429	102,399	110,032
14. Gross Output	148,671	144,054	151,441	156,058	156,058	150,148	156,243	172,680	166,585	160,675	159,198	172,680

TABLE III—*continued*

ITEM	1945/46	1946/47	1947/48	1948/49	1949/50	1950/51	1951/52	1952/53	1953/54	1954/55	1955/56
1. Non Factor Inputs											
2. Farm Requisites	2,153	2,247	3,619	2,854	3,244	2,515	3,989	3,283	2,431	2,953	4,454
3. Fertiliser	3,742	4,797	5,006	5,065	5,989	6,302	6,517	6,888	6,819	8,881	9,551
4. Lime	765	811	910	977	1,044	1,076	1,182	1,104	1,164	1,351	1,500(*a*)
5. Seeds Imported	265	411	415	313	189	330	647	170	124	294	493
6. Fuel, Oil and Grease	2,639	2,945	3,254	3,764	4,646	5,319	6,022	6,830	7,200	7,963	8,361
7. Electricity and Power	1,197	1,223	1,275	1,313	1,416	1,467	1,485	1,534	1,564	1,574	1,579
8. Repairs and Maintenance:											
(i) Buildings, Structures and Fences	5,073	5,100	5,142	5,208	5,348	5,485	5,596	6,075	6,449	7,115	8,153
(ii) Plant and Machinery	3,903	4,165	4,598	4,933	5,276	5,632	6,060	6,219	6,195	6,553	7,000(*a*)
9. Haulage and Cartage	2,436	2,526	2,596	2,685	2,800	2,892	2,867	3,004	3,027	3,097	3,209
10. Depreciation:											
(i) Buildings and Structures	2,911	2,945	2,997	3,063	3,146	3,226	3,292	3,568	3,794	4,186	4,796
(ii) Plant and Machinery	3,202	3,400	3,739	4,005	4,436	4,669	4,976	5,328	5,652	5,798	6,083
11. Other Inputs	27,023	21,321	25,282	24,297	38,600	47,734	40,551	47,150	43,500	38,900	33,600
12. Total Non Factor Inputs	55,309	51,891	58,833	58,477	76,134	86,647	83,184	91,153	87,919	88,665	88,779
13. Net Output	105,366	114,694	112,369	118,635	108,950	104,132	105,932	107,013	111,724	115,595	122,869
14. Gross Output	160,675	166,585	171,202	177,112	185,084	190,779	189,116	198,166	199,643	204,260	211,648

TABLE IV

Comparison of Net Farm Income and Output
1938/39, 1949/50 and 1955/56

£ million

	1938/39			1949/50			1955/56		
	Current Prices	1949/50 Prices	Price Index	Current Prices	1949/50 Prices	Price Index	Current Prices	1949/50 Prices	Price Index
Non Factor Expenses and Non Factor Inputs									
(a) Independently estimated (excluding depreciation) ..	12·9	21·7	59·4	29·9	29·9	100·0	56·5	44·3	127·3
(b) Depreciation	2·8	5·6	50·0	4·8	7·6	63·2	10·2	10·9	93·6
(c) Other expenses	7·4	12·8	57·8	38·6	38·6	100·0	48·1	33·6	143·1
Total	23·1	40·1	57·6	73·3	76·1	—	114·8	88·8	129·2
Factor Incomes and Factor Inputs (Net Output)									
(a) Interest	7·2	—	—	7·2	—	—	11·3	—	—
(b) Rent	2·3	—	—	2·0	—	—	2·8	—	—
(c) Land Tax	1·1	—	—	1·0	—	—	1·2	—	—
(d) Rates	2·3	—	—	3·9	—	—	7·0	—	—
(e) Wages	12·8	—	—	18·5	—	—	29·2	—	—
(f) Net Farm Income	21·8	—	—	79·2	—	—	118·3	—	—
Total	47·5	110·0	43·2	111·8	109·0	—	169·8	122·8	138·3
Gross Farm Income and Gross Farm Output	70·6	150·1	47·0	185·1	185·1	100·0	284·6	211·6	134·5

In the base year 1949/50, the difference of £2·8m. between factor incomes in current prices and in 1949/50 prices needs explanation. This is accounted for by the difference of £2·8m. between depreciation in current prices and depreciation in 1949/50 prices. This arises from the fact that the depreciation as given in farmers' accounts—which is what we wish to use in terms of current prices—is based on historical cost of assets. Only in conditions of complete price stability extending over the life of the longest lived assets would the

1. For all items expressed in current prices we have used the terms *incomes* and *expenses;* when expressed in 1949/50 prices we have used the terms *output* and *input.*

2(a) By *Gross Farm Income* we mean the total gross receipts at farm gate from the sale of farm produce, net of commissions, transport, and other selling costs, and after allowing for inter-farm sales. It includes an adjustment for the value of changes in livestock inventory.

(b) *Gross Farm Output* means Gross Farm Income in 1949/50 prices.

3. *Factor Expenses* means those amounts paid out by farmers to factors of production used in farming, such as wages, rent and interest on borrowed capital; plus amounts paid by way of taxes such as rates and land tax[2] but not income tax.

4(a) *Non-Factor Expenses* means all expenses paid out by farmers other than factor expenses.

(b) *Non-Factor Inputs* means non-factor expenses in 1949/50 prices.

5. *Net Farm Income* means income available to farmers (before payment of income tax) and equals gross farm income less the sum of factor expenses and non-factor expenses.

6. *Factor Incomes* equal the sum of Factor Expenses and Net Farm Income, and equals Gross Farm Income minus Non-Factor Expenses.

7. *Net Output* equals Gross Farm Output minus Non-Factor Inputs.

Our definitions can be summarized in the following two identities:

Gross Farm Income (in current prices) = Non-Factor Expenses + Factor Incomes (i.e. Factor Expenses + Net Farm Income).

Gross Farm Output (in 1949/50 prices) = Non-Factor Inputs + Net Output.

Factor incomes, or the total income arising in agriculture, represent the contribution made by agriculture to the national income in current prices. And net output represents agriculture's real contribution to the real national income or the net productivity of agriculture.

We can now review the figures given in Tables II and III. Table II gives our estimates of non-factor expenses, factor expenses, and net farm income for the years 1921/22 to 1955/56. Table III gives, for the same years, our estimates of non-factor inputs and net farm output. These two tables are closely related to each other. Up to and including line 11, identical items of expense and input appear on the same lines in each table and together they make up the total of non-factor expenses and non-factor inputs in line 12. From line 13 on, the two tables differ. In Table III we simply give in line 13, net output. In Table II total factor incomes are divided into the constituent items

2. In this respect we follow the current practice of New Zealand Department of Statistics in the official estimates of national income.

making up factor expenses, i.e. wages, interest, rent, rates and land tax in lines 14 to 18, and net farm income in line 21.

In making our estimates the basic data available were as follows:

(i) The value of farmers' incomes and farm wage payments calculated from the frequency distributions of incomes given in Income Censuses of 1926, 1936 and 1945.

(ii) The official estimates of net farm income for the post-war years.

(iii) The official estimates of gross farm income for the years 1926-1956.

(iv) The official estimates of volume of farm production for the years 1922-1956.

This data was then used in the following way. For those years for which income data is available—i.e. the census years and the post-war years—it was possible to make an estimate of total farm expenses by deducting net farm income from gross farm income. The problem then was to estimate farm expenses and net farm income for the intercensal years, given gross farm income for these years. These estimates were derived in two stages. First, for as many categories of expenditure as possible, independent estimates of each item were calculated either from official sources, e.g. rates and land tax collected, or as in the case of fertilizer, from the figures of local factory production plus imports.

For some other items, e.g. fuel used, and repairs and maintenance, consumption factors, secured from farm budget studies, were applied to the various components of the stock of equipment in use each year.

In making these estimates of money expenses and real inputs there was a considerable degree of interdependence. In some instances data on quantities were the more readily available and, after being expressed in terms of 1949/50 prices, special price indices were applied to convert them into current prices. In other cases the procedure was reversed and price indices were used to convert basic data expressed in current prices into terms of 1949/50 prices. The end result is the series of money expenses given in Table II and of real inputs given in Table III, excluding in both cases the item "other expenses" and "other inputs" in line 11.

These "other expenses" consist of the remaining known items of farm expenditure for which it was not possible to make direct estimates in the manner just described. They consist of the following items:

(i) Transport costs and distributive margins on those commodities such as fertilizer, seeds, requisites, etc., which were calculated at ex factory cost or landed cost.

(ii) Payments to farm contractors.

(iii) Insurance premiums, accountancy and legal fees.

(iv) General expenses.

For the census years and post-war years the total of these "other expenses" could be readily calculated from the identity:

Other expenses = Gross Farm Income — (Net Farm Income and Independently Estimated Expenses). There then remained the final problem of interpolation for the intercensal years.

The method adopted was to convert the censal year estimates of "other expenses" into 1949/50 prices, using for this purpose a new index of the price of farm input. These figures for other real inputs were then interpolated arithmetically and the interpolated real figures converted back into terms of current prices using the same index of prices of farm input.

Net farm income for each year was then calculated as the difference between gross farm income and total expenses, and net farm output as the difference between Gross Output and non-factor inputs.

In view of the rather arbitrary nature of this interpolation procedure, it was desirable that the results be checked as far as possible, against estimates of expenses or of income secured in some other way. Though the data available for such checks are not as plentiful or informative as we would wish, it has been possible to effect comparisons of our results with the results of some prewar sheep farm and dairy farm surveys. These comparisons encourage us to believe that our methods have not led to very grave error.

4. *Some Observations on the Results*

Some interesting conclusions emerge if we compare the changes between 1938/39 and 1955/56 in net farm income and net farm output. Such a comparison forms the substance of Table IV which shows in summary form the derivation of the net income and net output figures from Tables II and III and also gives indices of the price of non-factor and factor inputs. The figures for the base year 1949/50 are also shown.

This table shows that, between 1938/39 and 1955/56, whereas net output only rose by about 12 per cent, net farm income in the latter year was more than five times greater than in 1938/39.[3] This disparity is much more than can be accounted for alone by changes in the general price level; the reasons for it, as the table shows, are as follows:

(i) There was a favourable change in the farmers' terms of trade, the rise in the price level of output being greater than the rise in the price level of non-factor inputs.

(ii) There was a shift in the relative distribution of total factor income away from interest and wages paid towards net farm income. This resulted from the fall in the incidence of mortgage debt due to inflation and repayment of mortgages, and from the virtually stationary farm labour force as between the two years.

3. A similar result to that secured in Table IV has been secured by deflating the expenditure and income figures from the pre- and post-war sample of dairy farms and sheep farms mentioned earlier. This comparison, which is given in the monograph, indicates that the increase in real non-factor inputs occurred mainly on sheep farms.

(iii) Real net output did not rise nearly as much as real gross output because of the inordinate rise in non-factor inputs. This is a matter which calls for some further comment.

It is possible to think of three considerations, all of them as yet unmeasurable in their effects, which might be held responsible for the large increase in non-factor inputs, most of which it will be noticed is in the item "other inputs" which it was not possible to measure independently.

First, the permanent labour force was virtually the same in 1955/56 as in 1938/39 and many of the farm operations, e.g. fertilizer spreading, which would otherwise have required an increase in the farm labour force, have been done to an increasing extent by contractors using their own machinery. There is not a great deal of information available about farm expenditure on contractors' services and for this reason no attempt has been made to estimate them directly. They are included in the item "other inputs" and as such explain part of the increase in non-factor inputs.[4]

Secondly, it is possible that some proportion of non-factor inputs, in recent years, represents items of a quasi-capital nature (such as expenditure involved in bringing land back into full production) which farmers have been able to charge against revenue. There is, too, an effect arising from the considerable backlog of repairs and maintenance on buildings, fences, etc., which had accrued over the late 30's and the war years. The considerable rise in farm incomes dating from 1950 meant that farmers were in a position to make up for these arrears. So that actual spending on repairs and maintenance in recent years may well have been in excess of the notional figures we have allowed and this excess would form part of "other inputs". It is quite conceivable therefore that New Zealand farmers could continue to achieve the 1955/56 level of gross output with a lower level of non-factor inputs, which of course implies a higher level of net output. If the current fall in farm prices causes a fall in farm spending such a rise in net output could well be registered in 1958/59.

The third, and probably most important, factor accounting for the rise in non-factor inputs is that, with a stationary labour force, increased gross output has been achieved by a very great increase in the ratio of fixed and working capital to labour. The relatively small increase in net output which has resulted suggests that we may be running into diminishing returns to capital—but this requires careful econometric confirmation.

But in any event the results suggest that we should look closely at the possibility of reversing recent trends by increasing the ratio of

4. It is of course possible to argue that contract services should really be included in factor inputs or at any rate the labour content of those services; but apart from the lack of data mentioned above there is the objection that the group of firms engaged in contract work perform services for industries other than farming just as does say the machinery-repair industry, and there seems therefore more justification for treating them as an industry in their own right rather than, in some sense, as part of the farm labour force.

labour to capital. For much of the capital used in farming has a high import content and it appears that New Zealand is now entering into an era of fairly severe import scarcity just as it is also in the middle of an era when the ratio of labour to land and other resources has changed considerably in favour of the former.

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APPENDIX

Notes to Table II and III—Gross and Net Income and Output

The following notes give a brief indication of the sources used and estimation procedures adopted for each item given in Tables of Gross and Net Income and Gross and Net Output. Full details are available in the monograph referred to in the main text.

Tables II and III

Line 2—Farm Requisites—from Import Statistics.
„ 3—Fertilizer—from Industrial Production and Import Statistics.
„ 4—Lime—from Industrial Production Statistics.
„ 5—Seed Imported—from Import Statistics.
„ 6—Fuel, Oil and Grease—expense rates applied to stock of trucks and tractors.
„ 7—Electricity and Power—expense rates applied to stock of milking machines, shearing machines, etc.
„ 8—Repairs and Maintenance—expense rates applied to stock of equipment and buildings.
„ 9—Railage and Cartage—1949/50 figure derived from N.Z. Meat and Wool Boards' Economic Service sheep farm sample and New Zealand Statistics Departments' Dairy Farm sample—other years based on the 1949/50 figure adjusted by volume of production.
„ 10—Depreciation—Derived from the series of real capital invested in farm improvements, plant and machinery.
„ 11—Other Inputs—Interpolated in real terms between census years as described in the main text.

Table II: Gross and Net Income

Line 14—Wages were interpolated for census years on the basis of an index of paid workers combined with the index of farm wage rates.
„ 15—Interest payments from applying average interest rates to the rural mortgage debt and to the total of bank advances to stock and station agents.
„ 16—Rent paid is the sum of reported rentals received for Crown land plus 6·5 per cent of the unimproved value of leasehold land.
„ 17—Rates collected by rural local bodies as officially reported.
„ 18—Land Tax collected as officially reported.
„ 21—Net Farm Income for the years 1925/26, 1934/35, 1944/45 from the Official Censuses of Income. For 1938/39, 1946/47 to 1955/56 from Official National Income Statistics. For other years net farm income equals gross farm income minus total expenses.
„ 22—Gross Farm Income from Official Statistics.

Table III: Real Gross and Net Output

Line 13—Line 14 minus line 12.
„ 14—Derived from the Official Statistics of Volume of Farm Production.

ANOTHER LOOK AT THE ACCELERATION RELATIONSHIP AND EQUILIBRIUM GROWTH

1. *The Basis of the Acceleration Principle*

The period of World War II marks a fundamental shift in the formulation of the acceleration principle. We do not here refer to those more sophisticated modifications in the direction of a more "flexible accelerator", such as the introduction of distributed lags or allowance for unused capacity on the one hand or bottlenecks on the other which have been designed to make the accelerator more "realistic". Rather, we are concerned with something much more fundamental. In particular, we are concerned here with the change from the pre-war conception of induced investment as a function of the rate of change of *consumption* to the latter-day view that it is a function of changes in income (or output).

It is worth tracing through this change of ground by economists and examining the arguments by which it is justified. In early post-Keynesian writings the acceleration principle was conceived to express, following J. M. Clark,[1] a relationship between the level of investment and the rate of growth of consumption. Thus, to take two examples:

> Carefully stated, it [the acceleration principle] can be made to yield information concerning the movements of investment from a knowledge of the movements of consumption.—Samuelson.[2]
>
> The Acceleration Principle . . . concerns exclusively the effect of a net increase in consumption expenditures upon induced investment expenditures.—Hansen.[3]

In the post-war period, parallel with the renewed interest of economists in problems of economic growth—in which sector the acceleration relationship is seen as the determinant of a "required" rate of investment rather than as a causal explanation of the level of investment—there has been a virtually unanimous move away from this position. Now investment is related to the growth of income, not consumption. Thus:

> This error of thinking in terms of a ratio between capital and consumption rather than between capital and total output or income is very frequent in economic literature. It probably goes back to the idea that consumption is the final aim of production and that therefore all capital is used for the production of consumer goods. This is true in a stationary society.—Domar.[4]
>
> It will be noticed that I have posed the problem in terms of the effect on investment of changes in *output* as a whole (which of course includes investment); not, as has perhaps been more usual, in terms of the effect of changes in consumption only. In spite of the apparent circularity in my formulation, it seems to me to be the right one.—Hicks.[5]

1. "Business Acceleration and the Law of Demand", *Journal of Political Economy*, 1917.
2. "A Synthesis of the Principle of Acceleration and the Multiplier", *Journal of Political Economy*, Dec. 1939, p. 786.
3. *Fiscal Policy and Business Cycles*, New York, 1941, p. 274.
4. "The Problem of Capital Accumulation", *American Economic Review*, Dec. 1948, p. 789n.
5. *Trade Cycle*, Oxford, 1950, p. 38.

This change of view has been endorsed by Baumol,[6] Goodwin,[7] and others, as well as by Hansen himself.[8] Let us look at the arguments put forward in favour of the new position:

> . . . but what is the meaning of the ratio between the stock of capital and that part of its output which is sold to consumers? Surely the whole plant and equipment of General Motors is not used for the production of passenger automobiles (more correctly—only those to be used for non-business purposes), while trucks and Diesel engines are produced in mid-air. It hardly makes any difference to the management from the point of view of utilization of capital, its profitability, investment prospects, etc., whether the capital is used to produce consumption goods, materials to be used for further production, or investment goods.—Domar.[9]
>
> The building of houses, for instance, reckons as investment activity; but an increase in the demand for new houses induces investment in brickworks, sawmills, and glassworks, just in the same way as an increase in the demand for cigarettes induces investment in cigarette-making machinery.—Hicks.[10]

At first sight, this shift of position appears as little more than a minor change in definition, and the arguments for it seem convincing enough. However, the change is basic, because it represents a very important change of principle. The *essence* of the acceleration principle as an explanation of investment,[11] is that it proceeds from the premise that the demand for investment goods is a *derived* demand. From this it follows immediately that the demand for investment goods must derive from the demand for final consumption goods, since these are the only goods *which are bought for their own sake*, by definition. The demands for all other types of output are themselves derived from elsewhere, ultimately from the demand for consumption goods.

Therefore, if we think of the acceleration relationship as determining in some sense an equilibrium or "required" rate of investment, it is not good enough merely that the rate of investment matches changes in *output*. (Indeed, to insist that it is, is to come perilously close to re-asserting Say's Law—of which more hereafter.) There must also be congruence between the growth of investment and the expansion of consumption. It is basic to the job of the acceleration principle that it state this necessary congruence.

Perhaps the point may best be established by taking an extreme example. According to the Domar-Harrod formula for equilibrium growth, the "required" rate of growth of investment is given by $\frac{\Delta I}{I} = a\sigma$, where a is the marginal propensity to save and σ the "capital coefficient".[12] Now consider the limiting case when $a = 1$. Then if, say $\sigma = \frac{1}{4}$, the equilibrium rate of growth of investment will be $1 \times \cdot 25 = \cdot 25$ or 25 per cent. Now in what sense can the system

6. *Economic Dynamics*, New York, 1951, p. 39.
7. *Income, Employment and Public Policy* (Essays in Honour of Alvin H. Hansen), New York, 1948, Part I, Ch. V.
8. *Business Cycles and National Income*, New York, 1951, p. 173.
9. E. D. Domar, *loc. cit.*, p. 789.
10. J. R. Hicks, *op. cit.*, p. 38.
11. For the present we are ignoring altogether autonomous investment; care will be taken of this in Section 4 following.
12. Vide E. D. Domar, "Expansion and Employment", *American Economic Review*, March 1947, p. 41.

be said to be in equilibrium when capital goods are being piled up at a compound rate of 25 per cent, *while consumption remains fixed?* In what sort of output would this rapidly growing investment be embodied? Certainly not in the form of sewing machines or bakers' ovens, for the demand for clothing and bread is stationary. Nor could the investment be made in equipment for producing sewing machines or ovens, nor again in buildings to house such equipment, for the same reason. And so on. J. B. Clark has suggested that, in these circumstances, there is no reason why the system should not be geared to "build more mills that should make more mills for ever".[13] But the elementary point remains: who is going to buy such mills, and for what purpose?

The dilemma arises, of course, from the fact that savings (investment), as Keynes had sternly to remind us, must be embodied in physical forms which are technically dated and always involve some carrying costs. So long as the rate of interest on money is positive, it will never pay a private entrepreneur to store up savings in investment goods, the marginal productivity (realizable) of which is zero in virtue of the stationary consumer demand. As Dobb has pointed out:

> J. B. Clark's picture . . . can never be actualized, since in the real world mills are always specialized to a particular current stream of demand connected with consumption in the near future, and not a stream of demand stretching to an infinite future. Hence when consumption changes, the effect is transmitted back along the stream of demand to all the intermediate and constructional processes connected with it and adapted to it.[14]

This seems clear enough. Nevertheless, we still have to meet the argument of the "moderns" that capital goods themselves require other capital goods to produce them, and hence that an increase in investment will induce (or "require") a further increase in investment, in the same manner as will an increase in consumption. Now it is certain that, *if* there is an increase in investment, then this primary increment of investment will induce a secondary increment of investment. But how does the primary increment in investment come about in the first place? It is certainly true, as Domar points out, that production of trucks requires capital quite as much as does the production of cars. But there is a vital distinction between cars and trucks: cars are bought for their own sake; trucks are not! Hence, an increase in the demand for trucks—and for capital with which to produce them—presupposes an increase (or anticipated increase) in the demand for goods requiring transportation. Similarly, with Hicks's example: additional cigarettes will be bought for their own sake; but an increase in the production of houses (investment) presupposes an increased demand for house-room—essentially a consumer good. Indeed, if this increased demand for house-room, at the consumer level, were not forthcoming, the new house-building could not proceed—for long.

13. J. B. Clark's preface to the English translation of Rodbertus' *Overproduction and Crises*, quoted from M. Dobb, *Political Economy and Capitalism*, London, 1937, p. 92.

14. M. Dobb, *op. cit.*, p. 104.

2. *Investment as a Function of the Rate of Change of Consumption*

It will be seen, therefore, that there is merit in both points of view, the old and the new. On the one hand, investment is never undertaken for its own sake. (We are still abstracting from autonomous investment.) Ultimately, investment has its justification in increased output of consumer goods. On the other hand, an increase in the rate of investment, induced by expanding consumption demand, will certainly induce further investment outlays in turn.

Fortunately, it appears possible to combine the requirements of both viewpoints. Let us call the immediate investment required (say bakers' ovens) in the period dt *primary* investment, and denote it by I_1. Then, using the notation of the differential operator, viz., $D^nC = \frac{d^nc}{dt^n}$, and taking v as the "acceleration coefficient":

$$I_1 = v\frac{dc}{dt} = vDC.$$

Thus, for example, if the consumption of bread were expanding linearly such that $C = C_o + bt$, I_1 would be equal to vb and constant, with oven-makers supplying a fixed quantity of ovens in each period. Apart from replacement expenditures by bakers and oven-makers, no further investment outlays would be indicated.

However, if consumption (of bread) were expanding at an accelerating rate, I_1 would also be required to expand so that an increasing quantity of ovens could be supplied to bakers. The increment in primary investment which would be called forth would be:

$$DI_1 = vD^2C.$$

Now this increment in primary investment will require *secondary* investment to sustain it. If we call this second-round investment I_2, then:

$$I_2 = vDI_1 = v^2D^2C$$

and

$$DI_2 = v^2D^3C.$$

In turn, any increment in secondary investment will require a *tertiary* investment outlay, so that:

$$I_3 = vDI_2 = v^3D^3C.$$

This process may be continued indefinitely, so that we get an acceleration relationship of the form:

$$\begin{aligned} I &= I_1 + I_2 + I_3 + \ldots + I_n + \ldots \\ &= vDC + v^2D^2C + v^3D^3C + \ldots + v^nD^nC + \ldots \quad .. \quad .. \quad (1) \end{aligned}$$

Thus, we obtain an Accelerator which, like the Multiplier, is given as the limiting sum of an infinite series.[15]

15. This is a peculiar-looking series, although it is not an uncommon form in certain problems of physics. For the economist, the relationship (1) may perhaps best be looked at as a rudimentary input-output form, with each term of the series representing successive stages in the production process. If we had columns representing consumption and the successive stages of the provision of capital equipment (see Table 1 below), the flow through each column would depend upon the rate of change in the flow through the preceding column.

It is clear from (1) that, if consumption is stationary, i.e. if $dC/dt = 0$, then the required investment is zero; if consumption grows linearly, i.e. if dC/dt is constant, the required investment will also be constant. An interesting case is that where consumption grows at a steady rate such that $C = C_o e^{rt}$ and hence $D^n C = r^n C$, so that:

$$I = vrC\,(1 + vr + v^2r^2 + v^3r^3 + \ldots) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

If $vr \geqslant 1$, then this series is divergent, and hence there would be no amount of investment which would satisfy the equilibrium conditions. For example, if $v = 4$ ($\sigma = \frac{1}{4}$) and r were equal to ·25 or 25 per cent, there would be no amount of investment which would provide sufficient capital to sustain this rate of growth of consumption. The case is analogous to the divergent Multiplier when the marginal propensity to consume is greater than unity, and may be ruled out as a practical possibility. If $vr < 1$, the r.h.s. of (2) converges, so that:

$$I = \frac{vr}{1 - vr} C_o e^{rt}$$

or generally in terms of the differential operator:

$$I = \frac{vDC}{1 - vD} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

from (1).

Thus, we have arrived at a form of the accelerator which explicitly relates the level of required or induced investment to changes in *consumption*. Moreover, this formulation meets the point that investment as well as consumption goods require capital for their production; for an increment of investment, which is itself called forth by an expansion of consumption, will in turn induce further investment. But the causal sequence, in the nature of a chain-reaction, must be maintained. Investment, of itself, cannot justify investment; investment cannot pull itself up by its own bootstraps. Once this condition is introduced, we eliminate the circularity which Hicks is constrained to recognize in his own formulation. Indeed, given this fundamental boundary condition, it can be shown that our form of the acceleration relationship is only a particular case of the present day concept of the relationship which makes investment a function of the rate of change of income. Immediately from (3):

$$I - vDI = vDC \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

so that

$$I = vDY,$$

where Y is income.[16]

Solving (4) for I we get the general solution:

$$I = Ae^{t/v} - e^{t/v} \int e^{-t/v}\, DC\, dt,$$

where A is an arbitrary constant and $Ae^{t/v}$ the complementary function. Moreover, since our particular equation (1) requires that if C is constant so that $\frac{dc}{dt} = 0$, $I = 0$, then A must equal zero and we have the particular solution:

16. This result may be obtained directly from (1) by differentiation and then subtraction from (1).

$$I = -e^{t/v} \int e^{-t/v}\, DC\, dt \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

which gives us the general functional dependence of I upon $\frac{dc}{dt}$ in more compact form than (1).[17]

3. *The Accelerator and Equilibrium Growth*

The basic difference between our form of the accelerator and that currently in general use may be illustrated by reference to the Harrod-Domar model of equilibrium growth. Consider, for example, the consequences for equilibrium growth of a change in the marginal propensity to save and, hence, in the rate of expansion of consumption. Since $\Delta C = (1 - \alpha)\ \Delta Y$ by definition, any change in the marginal propensity to save, α, will alter the relationship between the increment of consumption and the increment of income. Although the Harrod-Domar conditions are designed to maintain an appropriate relationship between investment and increments of income, they do not, in these circumstances, achieve the same in respect of the increments of consumption.

Let us take an arithmetic example in period form. For this purpose, we need the accelerator:

$$I_t = v\Delta C_{t-1} + v^2\Delta^2 C_{t-2} + v^3\Delta^3 C_{t-3} + \ldots.$$

which can be shown to be the particular form of the simple unlagged accelerator:

$$I_t = v\ (Y_t - Y_{t-1}).^{18}$$

In our example, we take the marginal propensity to save as 10 per cent and the "capital coefficient" as $\frac{1}{4}$ $(v = 4)$ over the first five periods. This warrants a rate of growth of $2\frac{1}{2}$ per cent. In the sixth period, the marginal propensity to save is supposed to rise to 20 per cent. Hence a new rate of growth of investment of 5 per cent is indicated.

The side of the table to the left of the double line sets out the changes of income, investment and consumption appropriate to the Harrod-Domar model. It may easily be checked that the required relationship between *total* investment and the increments of income, the *sine qua non* of equilibrium in the model, is maintained throughout. This would, on the face of it, confirm Domar's explicit belief that changes in the marginal propensity to save and the "capital coefficient" are consistent with equilibrium growth.[19]

However, turning to the r.h.s. of the table where our accelerator is in action, it may be seen at a glance that the change in the marginal propensity to save between the fifth and sixth periods not only ruptures

17. It will be noticed that the arbitrary constant arising from this integration will have merged with the complementary function and hence will also equal zero.

18. See Appendix where the case of a lagged accelerator is discussed.

19. "These results were obtained on the assumption that α, the marginal propensity to save, and σ, the average productivity of investment, remain constant. The reader can see that this assumption is not necessary for the argument, and that the whole problem can be easily reworked with variable α and σ", E. D. Domar, "Expansion and Employment", *loc. cit.*, p. 42.

TABLE I

Period	Y	I	C	ΔC	Induced Investment				
					I_1	I_2	I_3	I_4&c.	I
1	1000	100	900	22·5	90	9	·9	·1	100
2	1025	102·5	922·5	23·06	92·25	9·23	·92	·1	102·5
3	1050·62	105·06	945·56	23·64	94·56	9·46	·95	·09	105·06
4	1076·89	107·69	969·20	24·23	96·92	9·69	·97	·11	107·69
5	1103·81	110·38	993·43	22·08	88·32 *99·34*	0 *9·93*	0 *·99*	0 *·12*	88·32 *110·38*
6	1131·41	115·90	1015·51	23·18	*92·72*	*18·55*	*3·70*	*·93*	*115·90*
7	1160·38	121·70	1038·69	24·34	*97·36*	*19·47*	*3·90*	*·97*	*121·70*
8	1190·81	127·78	1063·03	25·56	*102·22*	*20·44*			
9	1222·75	134·17	1088·58	26·83	*107·34*				
10	1256·29	140·88	1115·42						

Figures on the r.h.s. represent the investment which would actually be induced, those in italics the investment "required" to satisfy the conditions for equilibrium growth.

equilibrium, but does so explosively. This rupture of equilibrium, it will be seen, is brought about because of the *distribution* of investment flows and investment goods capacity. In some sense, a rise in the propensity to save requires that the structure of production should become more "roundabout". Resources have to flow from the lower stages of investment goods production to the higher stages. This could only occur if two (very unreal) additional conditions were fulfilled:

(1) Capital goods would have to be of the nature of Professor Swan's "mechano sets".[20] It must be possible to transmute (say) bakers' ovens and capacity for making bakers' ovens into steel mills and capacity for making steel mills, and so on, since the higher stages of production have suddenly to be expanded at the expense of the lower stages.

(2) The initiative to expand investment must come in the industries furthest removed from the consumption goods industries, the change in demand for whose products has precipitated the new situation. Incidentally, the investment decisions so taken must be in the opposite direction to those indicated by the change in consumer demand.

This second point highlights a general operational difficulty involved in the Harrod-Domar conception of equilibrium growth, once

20. T. W. Swan: "Economic Growth and Capital Accumulation", *Economic Record*, November 1956.

we allow the parameters of the system to change. According to their model, a rise in the marginal propensity to save requires that the rate of investment should be *increased*. But a rise in the marginal propensity to save can only manifest itself (in the market) by a slowing down of the rate of growth of consumption and hence the demand for consumer goods. The natural reaction of entrepreneurs to this will be to *reduce* their investment outlays, not increase them. The decision to reduce investment would, of course, first be taken in the consumption goods industries; but this would soon be transmitted back along the structure of production.

It may be objected that these models of equilibrium growth are merely "ideal" statements of conditions which do not claim any causal or operational significance. However, both Domar and Harrod tend to give them one. Thus, Domar suggests that equilibrium expansion may be attainable, if the government were prepared to underwrite the appropriate growth of income, or if entrepreneurs themselves were prepared to exercise a "kind of collective faith", as Mrs. Robinson has described it. Harrod also believes that entrepreneurs may be willing to tread the path of equilibrium growth and to expand their investments at the required rate, so long as their maturing investments are continually justified by an appropriate growth of income.[21] But as our arithmetic example shows, an appropriate expansion of *income* is not of itself a sufficient condition for equilibrium expansion.

Finally, it may be pointed out that our argument of this section in no way depends on lags. Introduction of a lagged acceleration relationship would of course enormously intensify the difficulties of transition from one value of the marginal propensity to save to another.

4. *Autonomous Investment*

We have argued above that the notion of investment inducing further investment presupposes that the primary increment of investment is itself "justified" by an appropriate expansion of consumption-demand. This is not true, by definition, of autonomous investment; and we must therefore take account of this.

Autonomous investment may be divided into two broad categories: (i) that investment which does not have to satisfy the normal commercial canons of profitability, e.g. churches, armaments, and WPA projects; and (ii) that investment which, while having to be justified by productivity criteria, does not depend upon additional market-demand either currently or in the immediate future, e.g. cost-reducing innovations, new products which can capture market-demand from old products, and long-range investment projects such as dams, irrigation schemes, oil exploration, etc.

21. Cf. e.g. "The line of output traced by the warranted rate of growth is a moving equilibrium, in the sense that it represents the one level of output at which producers feel in the upshot that they have done the right thing, and which will induce them to continue in the same line of advance . . .", R. F. Harrod, *Economic Journal*, March 1939, p. 22.

In practice, of course, it may often be difficult to draw a clear-cut line between investment which is autonomous and that which is induced. This is perhaps most true in the case of innovations. Many innovations only become economical if a large output can be assured and consequently their introduction often depends upon some actual or anticipated expansion of demand. More generally, the introduction of innovations, as well as many other forms of autonomous investment, will depend upon the general climate of expectations, and this will clearly depend to some extent on the degree in which demand conditions generally are expansive. However, conceptually the distinction between autonomous and induced investment is clear enough.

At all events, the important point for the present discussion is that an increase in autonomous investment will induce further investment in precisely the same way as an increment of consumption. Therefore, if A is autonomous investment and I_n is net investment, then:

$$I_n = A - e^{t/v} \int e^{-t/v} D\ (A + C)\ dt.$$

Perhaps the clearest-cut case of autonomous investment is pure replacement expenditure. Moreover, an increment of replacement expenditure will have the same Multiplier and Acceleration effects as an increment of consumption or of autonomous investment. Therefore, if R is pure replacement expenditure and I_g is gross investment:

$$I_g = A + R - e^{t/v} \int e^{-t/v} D\ (A + C + R)\ dt$$

and gross income Y_g will be:

$$Y_g = A + C + R - e^{t/v} \int e^{-t/v} D\ (A + C + R)\ dt. \quad \ldots\ (6)$$

The acceleration relationship set out in (6) is, of course, much more cumbrous than the usual formulation; but in extenuation the writer may claim for it three important advantages: (i) it clearly distinguishes between the dependent and independent variables in the relationship, thus avoiding the circularity of the more usual formulation; (ii) this statement of the independent variables has important analytical advantages particularly in study of the trade cycle because the rates of change of consumption, autonomous investment and replacement expenditure are likely to vary as against each other during various phases of the cycle; and (iii) the formulation here given shows explicitly that increments of autonomous investment or replacement expenditure are not merely additive, but exert a strong leverage on total investment in the same way as an increase in consumption.

5. *Conclusion*

The fundamental flaw in the present-day approach to models of equilibrium growth and to the Acceleration Principle (which is involved in all these models, directly or indirectly) is the belief that it is the growth of *income* which justifies the required rate of investment. This belief comes very close to re-asserting Say's Law. This alleged "law", it will be recalled, began from the premise, correct in itself,

that in the process of production sufficient *income* will be distributed to the factors of production as will be required to purchase the total product (since gross-output = gross-income). However, it then proceeded to commit the *non sequitur* that therefore "supply creates its own demand". This doctrine was attacked at various times by a whole host of writers, including Malthus, Sismondi, Marx, Rosa Luxemburg, and Hobson. But so long as strong, if not noticeably smooth, capitalist expansion continued, Say's Law remained virtually undisputed within the academic halls. It was left to Keynes (or perhaps more correctly the Great Depression) finally to explode it. Although people may receive sufficient income to clear total output, they may not choose to spend it.

It is an interesting commentary upon the way economic "truths" have a way of changing with the state of the markets that, with the return of "normal" economic conditions (if war, rebuilding from war, and preparation for more war may be called normal human pursuits), economists have started to forget that, ultimately, it is consumption which must justify production. The term "under-consumption" has almost disappeared from economic literature. Now we say that, *if only savings are spent (invested)*, there need be no failure of effective demand. But can we pile up our savings in investment goods without inquiring into the *demand* for investment goods? Certainly private investors are *not* going to "spend" their savings in this fashion, unless there is maintained an effective demand for the products of the investment goods so created. To assert otherwise is to go along, at least half way, with M. Say; for isn't it to say that a sufficient supply of investment goods will create its own sufficient demand?

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Appendix

Consider the case when there is a one-period lag between an increment of consumption and the induced primary investment, a one-period lag between an increment in primary investment and the corresponding secondary investment outlay, and so on. Then:

$$\begin{aligned} I_t &= v\Delta C_{t-2} + v^2\Delta C_{t-4} + v^3\Delta C_{t-6} + \dots \\ &= v\,(C_{t-1} - C_{t-2}) + v^2\,(C_{t-2} - 2C_{t-3} + C_{t-4}) \\ &\quad + v^3\,(C_{t-3} - 3C_{t-4} + 3C_{t-5} - C_{t-6}) + \dots \end{aligned}$$

Using the shift operator E,* we get:

$$\begin{aligned} I_t &= vC_{t-1}\,(1 - E^{-1}) + v^2C_{t-1}E^{-1}\,(1 - E^{-1})^2 \\ &\quad + v^3C_{t-1}E^{-2}\,(1 - E^{-1})^3 + \dots \\ &= \frac{vC_{t-1}\,(1 - E^{-1})}{1 - vE^{-1}\,(1 - E^{-1})} \end{aligned}$$

* For the algebra of the shift operator, E, see R. D. G. Allen, *Mathematical Economics*, London (1956), Appendix A.

Hence:

$$I_t - vE^{-1}I_t + vE^{-2}I_t = vC_{t-1} - vE^{-1}C_{t-1}$$
$$\text{or} \quad I_t - vI_{t-1} + vI_{t-2} = vC_{t-1} - vC_{t-2}$$
$$\text{and} \quad I_t = v\,(Y_{t-1} - Y_{t-2})$$

which is the usual form of the accelerator with one-period lag. Although investment in period t depends upon the change of income between the two previous periods, that change in income in turn depends upon the movement of consumption over a succession of *previous* periods.

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NOTES

PROFESSOR HICKS' THEORY OF INVESTMENT AND POST-WAR INVESTMENT FIGURES IN AUSTRALIA AND THE UNITED STATES[1]

On the first page of the preface of *A Contribution to the Theory of the Trade Cycle*[2] Professor Hicks states, "if the theory which is here offered stands up to theoretical criticism, the next stage will be the concern of statisticians, econometrists, and (most of all) economic historians, who will have to see whether it does prove possible to make sense of the facts in the light of these hypotheses". This note is a first step in the "next stage", a comparison of Professor Hicks' theory of investment with post-war investment figures in Australia and the United States. The comparison shows that, at least in respect to investment behaviour it is "possible to make sense of the facts in the light of Professor Hicks' hypotheses". It also suggests factors that do not support Professor Hicks' model as a whole. The model provided a good framework for examining investment behaviour; but the examination suggested substantial modifications to at least one hypothesis that Professor Hicks considers important.

The post-war period was chosen because of a belief that some major criticisms of Professor Hicks' model have less weight when the model is used to explain the behaviour of Western economies since the Second World War rather than that in earlier periods. Professor Hicks' theory of investment can be summarized as follows: investment is composed of two parts, one of which, induced investment, is related to past changes in output, while the other, autonomous investment, increases by a constant percentage each year. Critics have questioned whether the assumption that autonomous investment increases at a constant rate is a useful one. Might not fluctuations in the level of this type of investment, which is all investment not induced by changes in the level of output, also be significant in the trade cycle?[3] This is an important criticism, but since the war there has been in both Australia and the United States an underlying buoyancy in investment that suggests that a part of investment may have increased steadily, despite small falls in the level of real output. Thus the theory is more likely to be applicable to the post-war period than to earlier periods.

In order to facilitate comparison with published figures for investment some slight changes have been made to the theory as set forth in *A Contribution to the Theory of the Trade Cycle*. The most important of these is that gross figures for investment and income have

1. I am indebted to Dr. K. A. Blakey for commenting on a draft of this note.
2. London, Oxford University Press, 1950.
3. See e.g. A. D. Knox, "On a Theory of the Trade Cycle", *Economica*, Vol. 17 (Aug. 1950), pp. 325-326.

been used, whereas Professor Hicks' model is in terms of net investment and income. This change was made because of the great difficulty in distinguishing between replacement and net investment statistics. It is supported by the view that, even in theory, it is better not to make the distinction.[4] Secondly, in *A Contribution to the Theory of the Trade Cycle* autonomous investment increases at a constant geometric rate over time, i.e. the investment equation may be written

$$I_t = A\,(c)^t + b\,(Y_{t-1} - Y_{t-2}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

(where I_t is investment and Y_t income in year t, t is time, b the acceleration coefficient, and A and c parameters relating to autonomous investment.)

For convenience this has been linearized, so that autonomous investment increases at a constant arithmetical rate over time, and the investment equation is:

$$I_t = A + b\,(Y_{t-1} - Y_{t-2}) + ct \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Over all but very long periods of time (say over periods under 15 years) there is no great difference between the two equations. Equation (2) will be compared with Australian and American investment figures. It will be noticed that figures for the United States have been taken back closer to the war years than those for Australia. It was desired to compare the theory with a relatively free enterprise economy. The United States dismantled her war-time controls more quickly than did Australia.

The "White Paper" national income and expenditure estimates for Australia are in money terms. The first step is to convert to real terms those for gross national product and gross private domestic investment. The published figures were deflated by means of a composite index which is a weighted average of the C series retail prices and the basic materials and foodstuffs wholesale prices indexes published in the *Monthly Review of Business Statistics*. The C series index was given twice the weight, in the average, of the wholesale prices index. The figures for the composite index are given in Table I. In Table I the deflated figures for gross national product and gross private domestic investment less farm stocks are also given.[5]

It can be seen by inspection that to lag investment one year behind changes in gross national product is likely to give the best results. The multiple correlation coefficient and regression equation for investment on time and changes in gross national product (lagged one year) were calculated by the classical least squares method. A multiple correlation coefficient of ·98 was obtained, together with the following regression equation:[6]

$$I_t = 422 + \underset{\cdot 05}{\cdot 61}\,(Y_{t-1} - Y_{t-2}) - \frac{5 \cdot 8t}{3 \cdot 5}$$

At first equation (2) seems upheld by the strikingly high value ob-

4. See e.g. A. D. Knox, *op. cit.*, pp. 321-322.

5. As farm stocks are greatly influenced by factors outside Australia, it was thought better to exclude them from the investment figures.

6. The figures under the coefficients are the standard errors adjusted for degrees of freedom.

TABLE I

Real Income and Investment, Australia 1947-48 to 1956-57

Current value figures in millions of pounds deflated by the composite index

Year	*Composite Index**	*Deflated Gross National Product*	*Change in G.N.P.*	*Deflated Gross Private Domestic Investment†*
1947-48	108	1860		
1948-49	120	1898	38	333
1949-50	133	2044	146	411
1950-51	155	2337	293	516
1951-52	189	2042	—295	589
1952-53	205	2052	10	235
1953-54	208	2191	139	385
1954-55	210	2334	143	496
1955-56	219	2411	77	472
1956-57	229	2464	53	399

* Base 1946-47 = 100.

† Excluding changes in farm stocks.

Sources: For 1948-49 and later years the undeflated figures for G.N.P. and investment were taken from the 1957 White Paper on *National Income and Expenditure*. For 1947-48 they were taken from the 1956 White Paper. £15m. was added on to the 1947-48 figure for G.N.P. to make it more comparable with those of later years. The composite index was calculated as described in the text from indexes published in the *Monthly Review of Business Statistics*.

tained for the multiple correlation coefficient, but examination of the regression equation suggests that including "t" has no significant effect.[7] If "t" is omitted so that the investment equation becomes

$$I_t = A + b\ (Y_{t-1} - Y_{t-2})$$

a correlation coefficient of ·97 is obtained together with the regression equation

$$I_t = 396{\cdot}9 + \underset{\cdot 06}{\cdot 61}\ (Y_{t-1} - Y_{t-2})$$

Thus a modified form of Professor Hicks' theory of investment fits the facts well in the post-war period in Australia. Two interesting points emerge from his comparison with these facts. First there appears to have been a large and stable amount of autonomous investment in Australia over the period examined, but this investment seems to be at a constant, rather than increasing level over time.[8] Secondly the acceleration coefficient is much smaller than Professor Hicks assumed. *A Contribution to the Theory of the Trade Cycle* assumes an acceleration coefficient greater than one. Professor Swan has shown that this assumption is not necessary to obtain the behaviour shown by the model.[9] Nevertheless ·61 is a lower value for the acceleration principle

7. Using assumptions similar to those outlined below when testing the hypothesis that "b" is greater than one, the hypothesis that "c" is equal to zero is accepted at the ·05 level of significance.

8. Probably between a quarter and a third of this "autonomous investment" was undertaken from motives of replacement, and would not correspond to autonomous investment in Professor Hicks' model.

9. "Progress Report on the Trade Cycle", *Economic Record*, Vol. XXVI (Dec. 1950), p. 198.

than those generally considered plausible. If it is assumed that the observations are a random sample from a hypothetical infinite population in which, given the values for change in gross national product, the values for investment are normally distributed, a student t test can be used to test the hypothesis that the acceleration coefficient is equal to or greater than one. As would be expected from the size of the coefficient and its standard error, at a ·01 level of significance the test statistic falls well within the area in which the hypothesis is rejected.[10] We can safely conclude that in Australia the acceleration coefficient was well below unity over the years under observation.

TABLE II

Real Income and Investment, the United States 1947 to 1957

Billions of 1947 dollars

Year	*Read Gross National Product*	*Change in G.N.P.*	*Real Gross Private Domestic Investment*
1947	232·2		
1948	243·9	11·7	38·8
1949	241·5	–2·4	28·1
1950	264·7	23·2	45.3
1951	282·9	18·2	45·2
1952	293·7	10·8	39·3
1953	305·3	11·6	38.5
1954	301·3	–4·0	37·9
1955	322·8	21·5	46·6
1956	332·0	9·2	47.6
1957	335·2	3·2	44·4

Sources: Survey of Current Business, July 1957 and February 1958.

The United States Department of Commerce publishes in the *Survey of Current Business* figures for the United States for real gross national product and real gross private domestic investment. These are given in Table II for the years 1947 to 1957. Inspection of Table II will show that any lag between change in gross national product and investment is less than one year, and is thus not discernible in the published figures. The multiple correlation coefficient and the regression equation were again calculated by the least squares method. A value of ·92 was obtained for the former, together with the regression equation

$$I_t = 29{\cdot}52 + \underset{\cdot 10}{\overset{\cdot 47}{}} \ (Y_t - Y_{t-1}) + \underset{\cdot 31}{\overset{1{\cdot}24t}{}}$$

If similar assumptions to those made in the Australian case are made, whether the acceleration coefficient is significantly less than one, and whether the coefficient of "t" is significantly different from zero, can be tested using a student t test. At the ·01 level of significance both the hypotheses that the acceleration coefficient is equal to or greater than one and that the coefficient of "t" is zero are rejected. Thus there

10. This means that the probability of getting a value of ·61 for the acceleration coefficient is less than ·01 if the "true value" is greater than or equal to one.

is again a somewhat surprisingly low value for the acceleration coefficient; but unlike its counterpart in Australia autonomous investment does increase significantly over time. In general in the American case the regression equation is not such a "good fit" as in the Australian case. It "explains" 84 per cent of the variance of investment as against 96 per cent "explained" by that for Australia. Nevertheless, ·92 is a sufficiently high value of the correlation coefficient to say that it is at least "possible to make sense of the facts in the light of Professor Hicks' hypotheses".

Apart from the discovery of the degree to which Professor Hicks' hypotheses fit the facts, two conclusions emerge. The first, that unlike its counterparts both in Professor Hicks' model and in the United States, autonomous investment in Australia has not tended to increase with time is the less significant. It could be explained by an unusually high level of autonomous investment in the years 1949 to 1951 due to the almost unprecedented boom in Australia at that time, or even due to backlogs in investment still remaining from the war years. More stress should be placed on the second conclusion, that in both Australia and the United States the value of the acceleration coefficient is closer to one half than to unity, which contradicts the widespread belief among advocates of the acceleration coefficient that one is the lowest plausible value of the coefficient.[11] Acceleration effects appear to have been important in the economies examined, but they may be a less destabilizing influence than is believed by supporters of the principle.

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11. See e.g. D. Hamberg, *Economic Growth and Instability* (New York, 1956), p. 45.

SOME STATISTICS OF SECURITY PRICES AND YIELDS IN THE SYDNEY MARKET, 1875-1955[1]

The purpose of this article is to present in summary form[2] some statistics of security prices and yields in the Sydney market for the period 1875-1955. It is believed they may be of use to researchers

1. These statistics are part of the results of an investigation into security prices and yields in the Sydney market which has been carried out with financial assistance from the Sydney Stock Exchange, the Life Offices' Association for Australasia, the Stock Exchange of Melbourne, the Bank of New South Wales and the Commercial Banking Company of Sydney Limited. For other results see D. McL. Lamberton, *Share Price Indices in Australia* (Sydney: Law Book Co. of Australasia Pty. Ltd., 1958) and "Economic Growth and Stock Prices: The Australian Experience", *Jour. Bus. Univ. Chicago*, xxxi, 3 (July, 1958). The statistics now presented for the period 1901-1955 were incorporated in a paper entitled "Some Aspects of Security Prices and Yields in the Sydney Market, 1901-1955" read before the Statistical Society of New South Wales in March, 1957. I should like to acknowledge the assistance of Miss Gwenda Cane, B.Sc., in this investigation and thank the firm of T. J. Thompson and Sons for lending their records.

2. The monthly and quarterly series from which the annual values shown here were computed are available from the author, Department of Economics, University of New England.

working on this period. While long term calculations from economic data, especially those involving the use of index number techniques, only provide somewhat impressionistic results and the securities market to which the data related was, for at least the greater part of the period covered, extremely narrow and of minor importance in aggregate capital formation, these series may be useful to indicate the broad changes in interest rates, local investment experience and the state of business confidence. In view of the growing belief that the role of oversea conditions as the initiating factor in fluctuations in the Australian economy has been unduly emphasized, such series, by virtue of their being computed on a monthly and quarterly basis, may also prove of use in examining the timing of fluctuations.

Share Price Indices

The share price indices are designed as measures of investment experience. A chained value ratio formula has been used and the indices are intended to show what would have happened to an investor's funds if, at the beginning of 1875, he had bought all shares quoted on the Sydney Stock Exchange, allocating his purchases among the individual issues in proportion to their total monetary value, and each month by the same criterion redistributed his holdings among all quoted shares. No allowance has been made for cash dividend payments, brokerage or taxation.[3]

Price data were drawn from the following sources: *Sydney Morning Herald* financial pages, January 1875-September 1882; T. J. Thompson and Sons' monthly *Stock and Share Reports,* October 1882-December 1903;[4] Sydney Stock Exchange official sales records, January 1904-June 1936. Details of the capitalization of companies were obtained from the *Sydney Morning Herald* financial pages, the *Australasian Insurance and Banking Record,* the *Australasian Joint Stock Companies' Year Books,* the monthly *Stock and Share Reports* of T. J. Thompson and Sons, *Jobson's Investment Digest,* and the *Investment Service* of the Research & Statistical Bureau of the Sydney Stock Exchange.

The following indices[5] were computed:

(i) *Financial,* monthly from January 1875 to June 1936 with base: average of the three years ended June 1939 = 100 (Table III and Graph 1).

(ii) *Commercial and Industrial,* monthly from January 1875 to June 1936 with base: average of the three years ended June 1939 = 100 (Table III and Graph 1).

(iii) *Mining,* monthly from January 1875 to December 1910 with base: average of the year ended June 1898 = 100 (Table III and Graph 1).

3. See Alfred Cowles and Associates, *Common-Stock Indexes* (Bloomington: Principia Press, 1939), pp. 17-24, and D. McL. Lamberton, *op. cit.,* pp. 45-47, for a fuller account of the methods employed.

4. Gaps in this source in August, September, November and December, 1889, January and June, 1890, and March, 1897, were filled using the tables published in the *Australasian Insurance and Banking Record.*

5. The Financial index is comparable with the Banking, Insurance and Trustee group index and the Commercial and Industrial index with the All Ordinary Shares (excluding financial) index published in *Share Price Indices in Australia,* Appendix 1, and currently computed on a daily basis by the Research & Statistical Bureau of the Sydney Stock Exchange.

TABLE I

Shares included in Price Indices

Year	Financial Index			Commercial and Industrial Index			Mining Index		
	Number included	Number surviving from previous five year period	Number surviving to 1935	Number included	Number surviving from previous five year period	Number surviving to 1935	Number included	Number surviving from previous five year period	Number surviving to 1910
1875	8	—	3	5	—	1	5	—	—
1880	9	8	3	5	5	1	4	3	—
1885	7	5	3	5	5	1	4	2	—
1890	8	6	5	6	4	2	10	3	6
1895	8	8	5	10	7	4	11	9	8
1900	7	7	5	12	12	5	18	11	11
1905	7	7	5	12	10	6	20	15	13
1910	10	7	8	21	12	11	14	12	14
1915	10	9	9	21	21	11			
1920	9	9	9	20	20	11			
1925	9	9	9	40	11	39			
1930	10	9	10	45	39	45			
1935	10	10	10	47	45	47			

The number of shares included grew from 7 in the Financial group, 5 in the Commercial and Industrial group and 5 in the Mining group in 1875 to 8, 10, and 21 in 1901. By 1936 the Financial group comprised 11 shares and the Commercial and Industrial group 47 shares. However, as shown in Table I, new shares were added and old ones were deleted. The changing composition of the Commercial and Industrial list becomes most noticeable in the early 'twenties when of 40 shares included in 1925 only 11 had survived from 1920.[6]

Monthly high and low prices were recorded for all shares traded and this list constituted the population for sampling purposes. The sample used then comprised all shares which had sold each month for any three years between 1875 and 1936. Resources were inadequate for dealing with the large number of shares which remained in the sample during the 1920's so further limitation was necessary. This limitation was carried out in random fashion while attempting to give representation according to size, type of enterprise and capital structure. Allowance made for the relationship between ordinary capital and preference and debenture capital partly took account of the debtor-creditor position of the companies.[7] The fact that low-priced shares show greater fluctuations in price than high-priced shares[8] was also taken

6. In view of the nature of the indices the changing composition of the shares included should be considered, strictly speaking, in terms of total market value rather than number of issues.

7. Cf. R. A. Kessel, "Inflation-Caused Wealth Redistribution: A Test of a Hypothesis", *American Economic Review*, XLVI, 1 (March 1956).

8. Cf. Z. Szatrowski, "The Relationship between Price Changes and the Price Level for Common Stocks", *Journal of the American Statistical Association*, 40 (1945).

into account. When all this had been done there remained the problem that shares which had traded continuously for a three-year period were not average stock exchange securities—the average premium on shares included was considerably higher than that on shares excluded. So that some upward bias was introduced. Especially is this true of the mining index. Of more than 600 mining shares traded between 1875 and 1910 only a few had a market "life" of three years; in many cases the "life" was less than a year and frequently as short as three months.

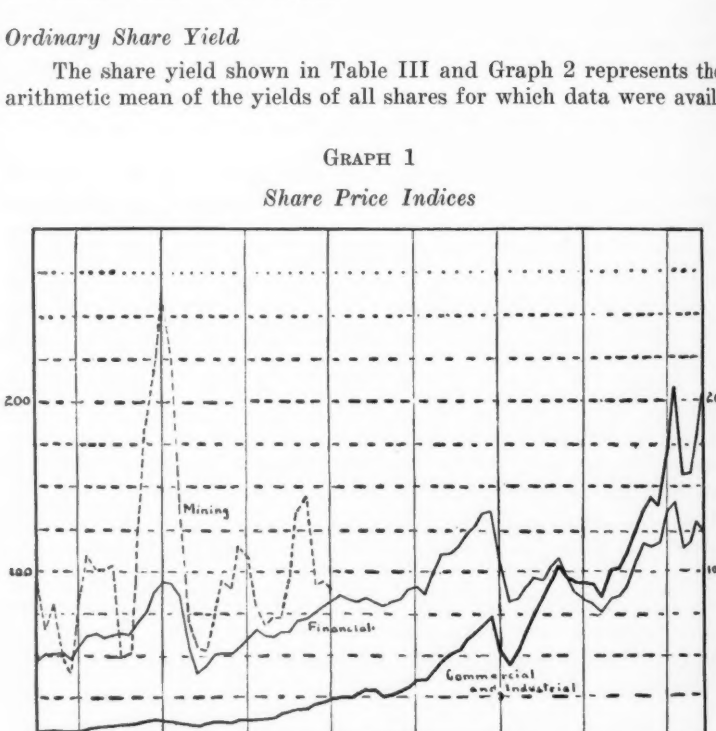
Although inter-company shareholdings were extensive and lead to duplication of weights, no adjustments were made. Oversea investment in Australian companies was not eliminated from the number of shares for the value product calculation. Where specific rights to issues of other classes of shares or to issues of shares by associated companies were given and traded adjustments were made according to the realized value of the rights.

Ordinary Share Yield

The share yield shown in Table III and Graph 2 represents the arithmetic mean of the yields of all shares for which data were avail-

GRAPH 1

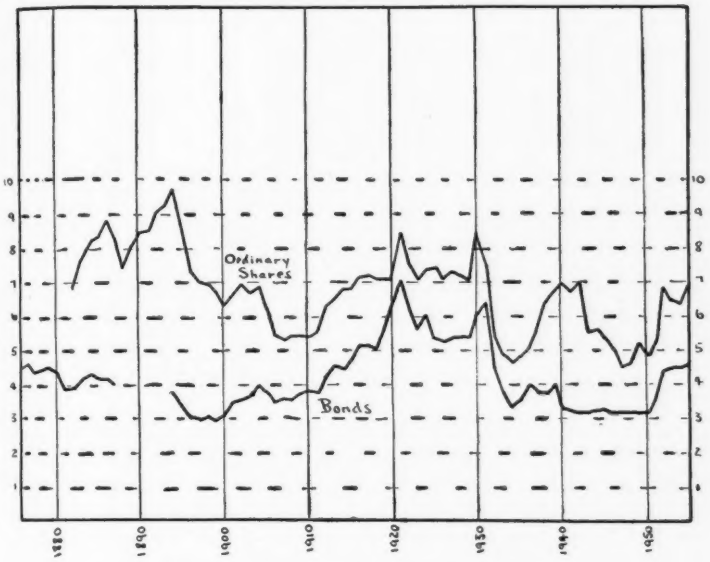
Share Price Indices



Base: Average of three years ended June, 1939 = 100 except for mining where average of year ended June, 1898 = 100.
Sources: January, 1875, to June, 1936, Table 3; July, 1936, to December, 1955, D. McL. Lamberton, *op. cit.*, Appendix 1.

GRAPH 2

Security Yields



Yield on ordinary shares is the average of quarterly yields while that on bonds is the average of monthly yields.
Sources: Ordinary shares, Table 3; Bonds, January, 1875, to December, 1925, Table 3; January, 1926, to December, 1955, Commonwealth Bank of Australia.

able in the last month of each quarter. The computations relate to the end of the month, except from 1914 to 1936 where they are mid-month values. The yield on individual shares was computed by expressing the dividend paid, or indicated, as a percentage of the price. Because of the difficulty of establishing what that dividend was considered to be at any time in the past the yield computations in the *Stock and Share Reports*[9] of T. J. Thompson and Sons and the *Official Gazette* of the Sydney Stock Exchange were used as a guide. As the *Stock and Share Reports* were available only from October, 1882, no attempt was made to compute yields for earlier months.

Dividend Rates

The dividend rate computations in Table II were confined to the period for which share yields were available but were not brought beyond 1900. They represent the weighted arithmetic mean of the end

9. Gaps in this source in September and December, 1889, June, 1890, and March, 1897, were filled using the tables published in the *Australasian Insurance and Banking Record*.

TABLE II

Mean Annual Dividend Rates of Companies Listed on the Sydney Stock Exchange

1882	12·2	1892	11·6
1883	14·5	1893	9·1
1884	14·6	1894	7·1
1885	14·0	1895	7·1
1886	13·0	1896	7·0
1887	14·8	1897	7·6
1888	13·5	1898	7·7
1889	13·5	1899	8·1
1890	13·0	1900	9·2
1891	12·4		

of year ordinary dividend rates of companies listed on the Sydney Stock Exchange. The weights employed were the issued ordinary capitals of the companies.

Bond Yield

The bond yield shown in Table III and Graph 2 was computed on the basis of sales deemed to have taken place at mid-month at a price equal to the mean of the high and low prices for the month adjusted for accrued interest and brokerage charges using the Financial Publishing Company's *Comprehensive Bond Values*. Price data, obtained from the same sources as the data for the share price indices,[10] were as follows:

1875–1887: New South Wales Government Terminable 1874-1902 bearing interest at 5 per cent per annum payable 1st January and 1st July;

1894–1900: New South Wales Government Funded Stock 1912 Option bearing interest at 4 per cent per annum payable 10th February and 10th August;

1901–1925: All New South Wales and Commonwealth Government issues maturing in more than six months for which price data were available. The yield shown is the unweighted arithmetic mean.

Although few sale prices were recorded after October, 1886, market activity did not come to as sudden an end as the yield series suggests. The *Stock and Share Reports* indicated sales without prices being recorded in November, 1886, and February, April and June, 1887. Buyers were present in July, August, September and October, 1887, throughout 1888, and from January to July and again in October, 1889. From April, 1893, until early in 1894, 4 per cent Funded Stock was on sale free of charges at all brokers. In November, 1896, 3 per cent Funded Stock was made available on similar terms.

The bond yield shown here differs statistically from both the short and long yields computed by the Commonwealth Bank of Australia for the period after 1925. However, overlapping computations for 1926 indicated fairly close agreement with the Bank's long yield.

10. Gaps filled as indicated in (4) above.

TABLE III

Security Prices and Yields in the Sydney Market 1875–1955

(Annual Averages)

Year	Share Prices			Yields		Year	Share Prices		Yields	
	Financial	Commercial and Industrial	Mining	Ordinary Shares	Bonds		Financial	Commercial and Industrial	Ordinary Shares	Bonds
1875	48·40	6·95	93·25		4·51	1916	79·32	27·35	7·16	5·16
1876	50·66	6·99	65·90		4·65	1917	81·32	27·75	7·19	5·18
1877	51·69	7·33	81·47		4·38	1918	83·60	29·53	7·07	5·07
1878	51·83	7·09	50·96		4·44	1919	88·01	31·57	7·09	5·60
1879	48·83	6·08	40·16		4·51	1920	90·88	35·44	7·07	6·28
1880	55·66	6·72	82·90		4·36	1921	86·54	36·32	8·39	7·05
1881	63·56	7·93	109·86		3·88	1922	99·58	41·09	7·42	6·17
1882	64·08	8·42	101·51	6·83	3·88	1923	110·26	47·69	7·03	5·60
1883	61·33	9·48	101·22	7·64	4·15	1924	110·02	50·20	7·37	5·97
1884	63·42	10·11	103·74	8·14	4·26	1925	114·52	53·78	7·40	5·33
1885	64·37	10·24	49·16	8·30	4·20	1926	121·50	59·79	7·08	
1886	63·74	10·38	51·68	8·78	4·18	1927	126·55	64·37	7·27	
1887	69·94	11·22	125·44	8·24	4·05	1928	134·84	69·95	7·20	
1888	76·77	13·41	184·38	7·36	—	1929	135·45	74·03	7·02	
1889	88·60	14·35	217·79	8·01	—	1930	101·55	51·49	8·38	
1890	94·79	13·02	262·12	8·45	—	1931	82·17	43·93	7·52	
1891	93·38	12·16	227·99	8·45	—	1932	83·65	52·55	5·38	
1892	85·75	11·15	129·73	9·06	—	1933	90·05	64·54	4·86	
1893	54·24	10·23	68·98	9·25	—	1934	96·05	75·35	4·77	
1894	39·29	9·98	55·07	9·71	3·75	1935	94·79	84·92	4·77	
1895	44·92	10·56	52·50	8·62	3·34	1936	103·53	93·78	5·03	
1896	52·20	11·78	75·00	7·28	3·08	1937			5·55	
1897	52·95	11·23	94·81	6·91	3·03	1938			6·38	
1898	52·46	11·64	89·09	6·87	3·10	1939			6·72	
1899	55·75	12·81	114·71	6·69	3·04	1940			6·91	
1900	61·62	13·57	109·98	6·32	3·16	1941			6·70	
1901	66·64	13·51	78·74	6·68	3·47	1942			6·95	
1902	61·98	13·58	65·83	6·88	3·59	1943			5·52	
1903	61·98	14·81	71·44	6·67	3·69	1944			5·60	
1904	63·79	16·60	71·42	6·84	3·97	1945			5·33	
1905	64·43	17·84	93·57	6·18	3·76	1946			4·97	
1906	71·10	19·12	134·25	5·47	3·46	1947			4·52	
1907	73·24	19·77	144·45	5·26	3·54	1948			4·66	
1908	75·38	22·00	91·31	5·46	3·59	1949			5·20	
1909	79·76	24·19	94·24	5·47	3·72	1950			4·86	
1910	84·21	25·24	88·15	5·38	3·78	1951			5·29	
1911	85·26	26·69		5·58	3·74	1952			6·81	
1912	83·87	27·03		6·33	4·24	1953			6·45	
1913	82·06	28·22		6·53	4·56	1954			6·37	
1914	84·78	31·03		6·76	4·38	1955			6·94	
1915	82·35	30·50		6·80	4·75					

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THE RELATIONSHIP BETWEEN SIZE OF FAMILIES AND INCOMES IN NEW ZEALAND 1949-50 TO 1953-54

I

There is a general presumption that the poor have more children than the rich.[1] Studies have, however, been made in U.S.A., Canada and Sweden which tend to indicate that fertility decreases with increasing incomes up to a certain income level only, after which it tends to increase again.[2] It appears that this trend applies to New Zealand as well.

New Zealand income tax statistics show tables which relate numbers of income tax assessments to income groups and the number of children under sixteen in the family of taxpayers. The restriction to children under sixteen may slightly bias the results in favour of the higher income groups if the trend towards larger families in these groups was only of fairly recent origin. However, this limitation on our figures does not seriously vitiate the results. Independent evidence which takes into account all children tends to confirm the findings from income tax figures. It must also be pointed out that income taxation during the years under review covered the vast majority of all income earners and that only an insignificant number of persons with children was exempt from making an income tax return.[3]

The following table shows persons returning incomes with four, and with five and more children, as a percentage of persons with one or more children. Persons without children have been ignored.

TABLE I

Persons with Four, and with Five and More Children, as percentage of all tax returns of Persons with One or More Children, 1949-50 to 1953-54

Income Group	*4 Children*					*5 + Children*				
	Year ended 31st March									
	1950	1951	1952	1953	1954	1950	1951	1952	1953	1954
£NZ										
200-400	7·6	7·2	7·5	5·5	9·9	7·7	9·9	8·7	11·4	8·9
400-600	7·2	7·3	7·5	8·0	8·3	5·5	6·4	7·8	9·0	9·6
600-800	8·9	8·4	8·8	8·5	8·5	5·4	5·4	5·9	6·4	6·7
800-1000	8·8	8·9	8·5	8·8	8·8	5·6	5·0	6·1	6·5	6·1
1000-2000	9·1	9·1	9·9	10·4	11·3	6·5	6·3	6·1	6·2	6·5
2000-3000	13.0	9·5	13·2	11·3	10·3	5·0	8·1	7·8	7·5	8·1
3000-4000	11.4	11·1	11·1	12·6	9·5	5·5	7·1	5·9	6·9	7·0
4000 + ...	12·4	11·3	12·3	12·8	13·4	7·1	5·9	5·8	6·3	6·0

Sources: *Report on the Income and Income Tax Statistics of New Zealand*, Department of Statistics, Wellington.

1. See United Nations Department of Social Affairs, *The Determinants and Consequences of Population Trends*, pp. 80 and 86.
2. *Ibid.*, p. 87, footnote 153.
3. Persons in receipt of incomes exceeding £300 and all persons engaged in any trade irrespective of the amount of income earned are required to furnish returns.

If we take the larger families first (five or more children) we find that there is a general tendency for the percentage of families to fall as income rises until the £800-£1,000 bracket is reached. This is quite in line with what one would expect. The £200 to £400 group has the largest percentage of families with five or more children. Included in this group are probably a fair number of Maori families who have very large numbers of children. The general assumption holds here that very low incomes and lack of foresight in terms of family planning go hand in hand. As income rises and we reach the salaried and lower professional classes the size of family falls.

But when we pass the £1,000 mark the size of families rises again. In two years out of five the £2,000 to £3,000 group, a really "high income" class, stands second only to the £200-£400 "near-pauper" group. And the £3,000 to £4,000 group, although lower than the £2,000-£3,000, shows figures in three out of five years which exceed the £600-£2,000 percentages.

When we come to the family of four we find in two years out of five a steady progression: that is, the higher the income the more families in that group have four children. In all but two cases, the £4,000 + income receivers have the largest proportion of four children families.

The importance of the trend towards larger families in the higher income groups can be seen from the fact that in 1953-54 twenty-nine per cent of all children under sixteen (149,751 out of 515,331) came of families with incomes exceeding £1,000 p.a. This compares with only 17·1 per cent of all tax assessments and 24·1 per cent of all tax assessments on persons with children, being on incomes over £1,000.

There is no reason to assume that the fact of not having included taxpayers without children in our comparisons leads to an overstatement of large families in the higher income groups. There are more people without children in the lower income groups, but it is impossible from the statistics to separate out those who are married without children and those who are unmarried. Table II shows the percentage of tax assessments for people without children in the various income groups.

TABLE II

Tax Assessments on Persons Without Children in 1954

Income Group	Percentage of All Tax Assessments *Percentage*
£NZ	
200-400	92·5
400-600	79·3
600-800	54·1
800-1000	42·7
1000-2000	44·2
2000-3000	48·1
3000-4000	46·2
4000 +	53·0

The results of our figures from income tax statistics are corroborated by an independent inquiry which was made by the New Zealand Department of Health in 1952.[4] Infants were divided into three groups according to the occupation of their fathers. The groups of occupations fell roughly into the following categories: Social Group I—Unskilled workers; Social Group II—Those not in Groups I or III; Social Group III—Employers and professional people.

Table III shows the number of children in the different groups that were first-born, those that were the second child and those that were the third or subsequent child. All figures refer to the last two quarters of 1952.

TABLE III

Births by Order in Certain Social Groups
(Last two quarters 1952)

	% of Births at Different Parities			
Social Group	*1st Child*	*2nd Child*	*3rd and Subsequent Child*	*All Births*
I	30·5	27·2	42·3	2,705
II	31·5	33·1	35·4	12,124
III	26·4	27.0	46·6	7,487

Source: *Report on the Medical Statistics of New Zealand,* 1952, Table X.

The Report from which the above table is taken comments: "It is noteworthy that the percentage of third and later children in a family is greater than average in both Group I and Group III. It is substantially higher in Group III than in Group I. This may be in part accounted for by the slightly higher average age of persons in Group III. There is no doubt, however, that the restriction on large families that is seen in other countries in occupational groups of the type found in Group III is not met with here. The most 'restrained' section in New Zealand is the middle group."

II

Two points may be mentioned to account partially for the trend which we have shown to exist in Part I.

It is well known that occupation and family size are strongly correlated. This applies in particular to the difference between urban and rural occupations, the rural birth rate being usually higher than the urban.[5] New Zealand is no exception. In 1956, for instance, the urban birth rate in New Zealand was below the average birth rate for Europeans—23·02 compared with 24·67 per 1,000 of mean population for the whole of New Zealand.[6] This means that the European birth rate in rural areas must be above average.

4. See *Report on the Medical Statistics of New Zealand,* 1952, compiled by the Department of Health, Wellington, p. x.
5. United Nations, *op. cit.,* p. 85.
6. See *Monthly Abstract of Statistics,* Tables 3 and 5.

On the other hand, farmers have very high incomes in New Zealand and, in fact, constitute the majority of income receivers in the highest groups. Table IV shows the percentage of farmers in various income groups:

TABLE IV

Percentage of Farmers in Income Groups 1949-50 and 1953-54

Income Group	*% of Farmers in 1949-50*	*1953-54*
£NZ		
200-400	5·2	5·3
400-600	5·6	4·9
600-800	14·0	4·5
800-1000	28·4	9.1
1000-2000	45·4	32.5
2000-3000	54·4	52·1
3000-4000		54·1
4000 +		58·1

Source: *Reports on the Income and Income Tax Statistics of New Zealand.*

The prevalence of farmers amongst the rich in New Zealand may account partly for the trend towards large families in the higher income brackets.

The second point which may be worth mentioning is a general social one. The whole social atmosphere in New Zealand is favourable to family life. Family allowances, free education, free medical services and the possibility for children to grow up in an uncrowded environment where there is scope for development—personal and economic—tend to make family life desirable, not to mention cultural factors like the spread of doctrines of "natural child birth" and emphasis on the emotional satisfaction obtained by having and rearing children.

In such an environment economic considerations may well enter into the determination of family size in a highly conscious manner. Income receivers below £1,000 feel that a large family cannot be sustained properly, especially if the wife works in order to make up a reasonable income, whereas the higher income groups are able to enjoy one of the advantages of life which consists, in the existing ethos, in having a large family.

Obviously such statements can be made only very tentatively and it is hardly the economist's job to substantiate them. Nevertheless, personal observation as well as general considerations tend to lead towards some such conclusion.

III

If there is substance in the considerations put forward in Part II two interesting conclusions emerge:

Size of family is determined by occupational structure as much as by income structure. Thus, if farmers become high income earners the

birth rate will remain high. On the other hand, if farmers leave the land, the birth rate will fall. In terms of general population theory this might mean that the hope for a reduction in birth rates in underdeveloped countries will have to be centred on occupational changes as much as on income changes. If the number of people dwelling on the land can be reduced, birth rates may fall, even if incomes do not rise spectacularly. Thus industrialisation of backward countries will tend to solve several problems simultaneously.

Another, even more hopeful conclusion for the future of mankind can also be drawn. If with advancing civilization a close correlation between economic and social prospects for large families and the actual size of families can be established—as seems to be the case in New Zealand, the spectre of over-population to the point of "no standing-space" seems to be banned. In other words, it is possible to hope that, with the growth of civilized living, parents will adjust their families to the economic environment in which the children will have to live. An even proportional development of productive forces and population will then ensue which would eliminate any contradictions between population growth and real income.

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ECONOMIC PRINCIPLES OF TRANSPORT REGULATION

Mr. R. R. Hirst, in his recent article, "Interstate Road Transport",[1] discussed the principles which should be adopted by a regulatory authority to ensure economic division of traffic between existing transport agencies. He stated that: "Efficiency will be achieved when the traffic arising from the existing pattern of industry is divided between the sectors of the transport industry so that aggregate costs to society . . . are lower than for any other distribution" (p. 276).

From this he argued that: "If the competing transport agencies calculate their charges by applying different percentage mark-ups on prime costs an economic division of traffic should develop between the competing sectors of the transport industry, providing the charges have the same ordering as the long run marginal social costs on which they are based. Thus the practice of differential freight rates is compatible with an economic division of traffic, providing the charge of a low cost producer for a particular unit of traffic does not exceed a less efficient competitor's charge for that traffic" (p. 277).

The validity of the argument is not questioned, but it is necessary to point out that it is valid only if division of *existing* traffic is the sole object of transport regulation. There are, however, other economic implications which should receive attention. The most important of these is the effect of transport rates on location of transport users, and it will be shown that differential freight rates may lead to a distortion of the

1. *Economic Record,* November 1956.

location pattern. Furthermore, the distorting effects of differential freight rates are not confined to location, but extend to any other factor or factors which, like location, may be substituted for, or are substitutable with, transport.

So far as location is concerned, a simple example will make the point. Differential freight rates mean, presumably ". . . differences in rates which are not explainable by cost considerations".[2] To avoid discussion of variations in cost, we may borrow Mr. Hirst's assumption of a homogeneous distance input or transport unit, a ton-mile. Assume that there are two possible locations for a new factory, identical in all respects other than transport. Location *A* is 60 miles from the raw material and market centre; location *B* 45 miles from the same centre. If we assume that rail transport is the lowest cost medium for both locations, but that competition for traffic is such that its charge for servicing location *A* is less than the charge for location *B*, it follows that the prospective manufacturer will settle at *A*. The rail charge is still below that for road transport, yet the differential pricing procedure has resulted in wasting the economy's scarce transport resources. Thus any pricing procedure which results in a charge which does not represent the marginal social cost of the resources necessary to make the service possible cannot lead to a rational resource pattern.[3]

So far reference has been made only to location, but it is clear that the argument can be extended to any factor of production which is substitutable at the margin for transport factors. This has been stated very clearly by W. Isard:[4] "When in a simple economy a farmer with a given amount of capital and other resources chooses to apply his efforts to cultivating new land on the periphery of the hinterland of a growing town rather than at cultivating intensively a more limited quantity of old land near the town, in general he anticipates reaping greater returns despite the fact that he applies less of his available labour to cultivation and more to marketing his harvest. In effect he substitutes distance inputs (indirect labour inputs) for direct labour inputs. He finds it profitable to do so in the same way that in using a plough that he has built, he finds in profitable to substitute services of capital goods (indirect labour inputs) for direct labour inputs".

Since the transport user decides on the combination of direct and indirect labour inputs on the basis of their respective prices, any deviation from long run marginal social cost pricing will have distorting effects.

2. D. H. Wallace: "Joint and Overhead Cost and Railway Rate Policy", *Quarterly Journal of Economics*, August 1934, p. 584.

3. See: R. L. Dewey: "Criteria for the Establishment of an Optimum Transportation System", *American Economic Association*, Papers and Proceedings, May 1952, esp. p. 649. Prof. A. G. Pool: "The basis of Transport Charges", *Journal of the Institute of Transport*, Jan. 1955, pp. 45/48. Prof. G. Walker: "New Thinking in Transport", *ibid.*, July 1955, pp. 159-65.

4. "Distance Inputs and the Space Economy, Part 1: The Conceptual Framework", *Quarterly Journal of Economics*, May 1951, pp. 190-1. See also more comprehensive discussion by the same author in: *Location and Space Economy* (Massachusetts Institute of Technology and John Wiley & Sons, Inc., N.Y., 1956) esp. Chapt. 9.

Where the price of the transport service is below long run marginal social cost the transport user will, so far as he is able, substitute transport factors for other factors at the margin; and where the price is above long run marginal social cost he will substitute other factors for transport factors. In other words, so long as the price of the transport service deviates from long run marginal social cost, he will tend to use more or less respectively of the economy's scarce transport resources than considerations of economic efficiency would require.

It is true, of course, that the transport users already mislocated as a result of the existing pattern of transport charges will be adversely affected by the adoption of any optimum pattern. It is doubtful, however, whether this is sufficient argument for the continuation of a practice which will ensure its perpetuation. Rational decisions on location and factor use can only be made if they are based on transport charges which reflect as accurately as may be possible the (cost of) resources used up in providing the service.

One other short comment on Mr. Hirst's paper. He says that: "As a road is a more elaborate structure than a rail track it would be reasonable, *a priori*, to expect the track costs of road vehicles to exceed that of rail" (p. 283).

There is no *a priori* reason why this should be so, since total track costs depend not only on initial construction costs, but also on maintenance costs and the intensity of use. The intensity of use is important because neither rail track nor road maintenance costs are a linear function of the intensity of use since rail tracks and roads deteriorate through exposure to the elements whether they are used intensively or not. Both rail track and road maintenance costs tend to decline per unit of traffic as the permanent way or road is used more intensively.[5] It is therefore not sufficient to refer only to construction costs, unless it is specifically assumed that intensity of use is the same for both types of route facilities and that there is no significant difference in maintenance costs. Neither assumption is likely to prove very realistic.

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5. See: Raymond, Riggs, Sadler: *Elements of Railroad Engineering* (John Wiley & Sons Inc., N.Y., 1947), Part 2, esp. p. 122. A. A. Walters: "Track Costs and Motor Taxation", *Journal of Industrial Economics*, Vol. 2, No. 2 (April 1954). H. Kolsen: "How to Pay for the Roads", *Australian Quarterly*, June 1957. *Report of Committee of Transport Economic Research Relating to Road and Rail Transport, Part I: Road Transport Costs and Road Construction and Maintenance* (Australian Transport Advisory Council, Melbourne, 1956), p. 58.

THOSE ELEMENTARY THEOREMS IN THE PURE THEORY OF PRICE

In his note on the above subject,[1] H. D. Pridmore rather slides over the problem of explaining the equality of marginal and average products at the average product's maximum: e.g. ". . . the fact that the average product is unchanged by the addition of a unit of labour is often expressed by saying that the average product is a maximum"[2] hardly convinces the majority of students. It omits the essential "why". Why, for example, does a monetary constancy of average product mean that average product is at its maximum whereas a momentary constancy of average cost means that average cost is at its minimum? This is a serious question for the student whose mathematics are not of a sufficient standard to appreciate the similarity of the conditions for maxima and minima. For these students, an approach which does not lay such emphasis on momentary constancy of average product (average cost) at its maximum (minimum) would seem to be indicated.

I have attempted such an approach below, and it seems as though it might have the added advantage of reconciling students to the disconcerting fact that schedules of marginal and average products (costs), drawn up without any special "cooking", more often than not do not give the required equalities at the maxima (minima) of the average data.

r = quantity of factor of production (output)[3]
a_r = average product (average cost)
m_r = marginal product (marginal cost) associated with quantities r and $r+1$ of the factor (output).

The following relationship (which corresponds to Pridmore's equation (3)) is implicit in these definitions:

$$a_{r+1} = \frac{r.a_r + m_r}{(r+1)}$$

whence:
$$\frac{a_{r+1}}{a_r} = \left(\frac{r.a_r + m_r}{(r+1)}\right)\left(\frac{1}{a_r}\right)$$

$$= \frac{r + \frac{m_r}{a_r}}{r+1}$$

From this it is clear that if $\frac{a_{r+1}}{a_r} \gtrless 1$, then $\frac{m_r}{a_r} \gtrless 1$, and *vice versa*.

These are Pridmore's propositions 2, 3 and 4, and their converses. In addition, they enable one to say something about the relation between average and marginal values when the average values change at various rates.

1. This Journal, Aug. 1957, pp. 265-7.
2. *Ibid.*, p. 267.
3. The same symbols are used for product and for cost, with the definitions for the latter being given as bracketed alternatives.

For the moment confining attention to the case of marginal and average product, one might visualize the usual, idealized, average product curve as a sort of inverted parabola. It is fairly obvious that average product rises at a decreasing rate, reaches a maximum at which it ceases rising and commences to fall, and then falls at a progressively increasing rate. In terms of the above expressions, $\frac{a_{r+1}}{a_r}$ starts above one and falls progressively until it is below one. $\frac{m_r}{a_r}$ does exactly the same, which means that marginal product starts above average product, converges on it, becomes equal to it, and eventually falls below it. The point of equality between marginal and average product, $\frac{m_r}{a_r} = 1$, corresponds to the point at which average product has ceased rising and is about to fall, $\frac{a_{r+1}}{a_r} = 1$.

The same procedure could be followed for average and marginal costs, with the obvious difference, of course, that the idealized average cost curve is similar to an ordinary, upright, parabola. In this case, of course, one is dealing with a minimum for average cost, as opposed to the previous maximum for average product.

It might be pointed out that, in a schedule where discrete units are used, the same process occurs, namely that $\frac{a_{r+1}}{a_r}$ progresses from one side of unity to the other. However, the schedule may not contain any data which would make this expression exactly unity. This does not invalidate the general proposition, that marginal and average values are equal at either the maximum or minimum of the average value, because this proposition is strictly true only for continuous data. However, in practice, provided that the unit of measurement is small relative to the total to be measured (whether factors of production or output) the deviation from equality will be so slight as hardly to matter.

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NEWS AND NOTES

Sir Lennon Raws, Honorary Life Member of the Economic Society of Australia and New Zealand, died in Melbourne on 19 April, 1958. Professor Sir Douglas Copland writes:

Sir Lennon Raws, Colonel W. L. Raws when I first met him in the early days of developing the Schools of Economics and Commerce at the University of Melbourne, played an important part in promoting economic study, in developing the interest of the business world in employing university graduates, and in the founding and fostering of the Economic Society of Australia and New Zealand. In all this work he was one of the pioneers from the business world of Melbourne, and therefore an ally of no mean stature to those of us in the academic world who sought to chart a new course. He had in an unusual degree a combination of the qualities of a genuine interest in and knowledge of the contribution to be made to business by those equipped with a broader academic training, and a recognition of the significance of the study of the economy as a whole in enunciating public policy.

With this background he contributed much in the early days of the School of Commerce in the University of Melbourne, where he was a member of the Faculty as well as of the University Council, and chairman of its Finance Committee. For me he was a wise counsellor and valued friend over many years. He made my task of establishing good and effective relations with the commercial world so much the easier and more rewarding. This he did in his own right as a man of discerning intellect as well as Australian Head of Imperial Chemical Industries. When the Economic Society of Australia and New Zealand was established in 1924 he gave active support to a new venture that was to prosper and contribute much to a wider understanding of the working of the Australian economy in expansion and depression alike. He was a foundation member of the Editorial Board of the *Economic Record* for its first issue in November 1925, and remained a member until his death in 1958. To those of us who participated in the promotion of economic study and research in Australia, Sir Lennon Raws will be gratefully remembered as one of the principal pioneers from the non-academic world in a venture that might have faltered but for the support that he and others with their wider interests from the world of commerce could so effectively give.

The Business Archives Council of Australia (Victorian Branch) in conjunction with the Department of Economic History of the University of Melbourne, is arranging a conference on "Australian Business History" at the University of Melbourne, October 24-25, 1958. Sessions will be chaired and papers given by: Professor Sir Douglas Copland, Professor Sir Alexander Fitzgerald, Messrs. H. L. White, I. McLaren, S. M. Gilmour, Dr. J. Ginswick, Dr. W. A. Sinclair, Professor H. Burton, Professor W. Woodruff, Messrs. G. M. Blainey, N. R. Wills, and Dr. A. Birch.

During the conference a collection of Australian business records

will be on display. It is hoped that representatives of both the business world and the universities will attend. Inquiries are invited to Professor W. Woodruff, Department of Economic History, University of Melbourne.

The first R. C. Mills Memorial Lecture was given, before an audience of some 700, in the Great Hall of the University of Sydney on 29th April. The speaker was Dr. Coombs, and his subject "The Conditions of Monetary Policy in Australia". With the lecture there has been published a memoir, bibliography and portrait of R. C. Mills. Copies may be obtained from the Department of Economics, University of Sydney; price 5/- for single copies, 4/- for orders of 20 or more, postage included in both cases: See "Books Received" for a notice of this publication.

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Auckland: A. D. Brownlie, Economics Department, University College, P.O. Box 2553, Auckland, New Zealand.

Wellington: I. F. E. Wilson, c/o Bowden, Bass & Cox, Public Accountants, 328-330 Lambton Quay, Wellington, New Zealand.

Christchurch: N. L. McBeth, c/o "Press", The Square, Christchurch, New Zealand.

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THE SOUTH AFRICAN JOURNAL OF ECONOMICS

Editors: W. J. Busschau, C. S. Richards (Managing Editor), H. M. Robertson

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REVIEWS

Economic and Technical Problems of Australia's Rural Industries. By D. B. WILLIAMS. (Melbourne University Press, Carlton, Victoria, 1957.) Pp. 146. 27/6 Aust.

This book, written by a former Assistant Director of the Bureau of Agricultural Economics, is stated to be a "brief review" of recent economic and technical developments in Australian agriculture. It does not purport to be a systematic analysis of Australian agricultural policy, though in the foreword the author expresses the hope that it may stimulate some more intensive investigations. In few places does Dr. Williams go beyond broad description, except where he wishes to canvass personal judgments.

The somewhat random choice of topics for discussion and the seemingly disproportionate amount of space allocated to transitory as compared with more significant issues suggests that the book might essentially represent a sampling of the files passing across the author's desk. Such information may throw some light on contemporary agricultural developments, but it is not the stuff of which serious studies of agricultural policy are made.

The introductory chapter, a rather woolly description of the influences shaping Australian agricultural policy, may unduly discourage some readers as it is the most badly written chapter in the book. Dr. Williams stands squarely on the side of those who argue that Australia should channel increased resources into its primary rather than its secondary industries. "The expansion of many non-rural industries, which cannot compete with imports without undue amounts of direct and indirect protection," he says, "involves a cost burden on our rural industries which is the very antithesis of well-directed economic growth" (p. 3).

Perhaps the predominant theme in this and the succeeding chapter on post-war economic policies is the now well-accepted fact that, in Australia, agricultural policy is influenced more by national economic objectives such as full employment and balance-of-payments equilibrium, rather than by specifically agricultural objectives.

After a heroic attempt to outline the structure of Australian agriculture in nine pages, the author moves on to a discussion of price and marketing policies. Though this discussion ultimately proceeds on a commodity basis, some introductory comments by the author on the prevailing method of agricultural pricing by reference to assessed production costs are refreshing and will be revealing to some people. For instance, Dr. Williams points out that some farm types have been excluded from cost analyses, "despite the fact that they represent a most significant section of the industry concerned". Moreover he says that "changing market conditions tend to influence the way in which particular items are included in the cost formula, and to influence the

negotiations as to how year to year cost movements are to be made" (p. 37). And yet people in this country, the Prime Minister included, talk about the "objective" and "technically correct" assessment of unit production costs.

Next follow two chapters on land settlement and rural taxation, topics which appear to have received a disproportionately large amount of attention. The former chapter is largely given over to a discussion of problems of Northern Australia. The author reveals that he shares with many other Australian agricultural administrators the usually unquestioned, but nevertheless unsubstantiated, belief that subdivision of rural holdings is a necessary prerequisite to agricultural development. In the next chapter recent changes in taxation law affecting rural producers are outlined. Williams asserts, without giving any concrete evidence, that "taxation allowances have proved to be one of the most effective measures adopted by the government to encourage rural development" (p. 71). The reviewer would suggest that the exact influence of these measures on rural investment is still a moot point.

Trends in rural investment and borrowing are next examined, and the recent tendency of Australian farmers to finance investment out of savings is stressed. Williams is an ardent supporter of the established B.A.E. view that present bank credit facilities and practices are not adjusted to the needs of the rural industries. The succeeding three chapters outlining recent developments in the application of new agricultural practices are purely descriptive on a somewhat technical plane.

A chapter on scientific and advisory services provides the author with an opportunity to present some facts about recruitment and salary problems in research and extension agencies and also a chance to make unfavourable comparisons with the American system. Williams implies that effective research is not likely to be done in the universities or elsewhere unless it is "co-ordinated". "This", he says, "is being achieved to an increasing extent, which is leading inevitably to the Commonwealth's assuming a more dominant role in the administration of agricultural research" (p. 103). The reviewer's experiences at the hands of would-be co-ordinators of research lead him to exactly the opposite conclusion to Dr. Williams.

In the final chapter, Williams discusses contemporary policy issues. The author, it appears, is an "agricultural expansionist" with some qualifications, though it is possible that his position is explained by the date the book went to press. The adverse trends in overseas markets coupled with the drought in 1957 have left such a mark on the rural industries that it may well be that this book deals with a stage in agricultural policy that is now a matter of history. However, some of the significant issues posed by Dr. Williams still remain and are deserving of the attention that he suggests. The effects of national wages policy and transport costs on the rural industries are two of these.

The most disturbing thing about this book to the reviewer is not the actual text, but what the author reveals inadvertently about the assumptions as to the nature of government which he takes for granted.

Here, in this book, a senior civil servant, whatever the disclaimers in his preface, writes about agricultural policy as seen from his desk in Canberra. There seems to be no doubt in his mind that it is the administrators who do and should predominantly shape agricultural policy. In his opening sentence, he speaks of "the administrative skill and acumen of those responsible for Australian economic policy" and after numerous references in the intervening pages to "policy makers" and how they must mould the climate of political and public opinion (p. 53), he presents on the last page an even clearer picture of his administrative credo. "It is within the context of day-to-day administrative decisions . . . ", he writes, "that leadership in rural policy must arise and find expression" (p. 130). It is undoubtedly this belief which prompts the author to ascribe much of the developments in Australian agriculture since 1951 to administrative acts in Canberra, whereas the perspective of history will probably reveal that exogenous factors like the price of wool were the real determinants of progress in these years.

The reviewer accepts the fact that agricultural administrators must assume certain roles by virtue of being located in a "clientele" department, and he also agrees that in Australia "we have developed a tendency to rely on government activity and to look to governments for leadership" (p. 105), but he does not believe that agricultural policy is shaped as exclusively by the Canberra planners (to use the author's term) as Dr. Wiliams would have us believe. Whatever the true picture, the fact that such views are expressed suggests that it behoves farmers' organizations and legislators to take a more intelligent and more broadly based interest in the formation of Australian agricultural policy than they have done in the past.

KEITH O. CAMPBELL

University of Sydney.

Ownership and Control of Australian Companies. By E. L. WHEELWRIGHT. (The Law Book Co. of Australasia Pty. Ltd., Sydney, 1957.) Pp. xii + 121 + Appendix 85 pp. 42/- Aust.

Mr. Wheelwright has produced a veritable Who's Who, or, better perhaps, a Debrett of Australian companies. Selecting the 102 companies with shareholders' funds of £2 millions or more in 1953, the author has put each of them on the dissecting table for an inspection of their economic gizzards. The conclusions he reaches after his vivisection are, in the main, similar to those reached by investigators into similar phenomena in the U.S.A. and the U.K.

The book represents an excellent piece of empirical research, obviously carried out with great patience and perseverance. For each company (except two which historical accidents made it necessary to treat in a slightly different way), information was extracted from the annual returns, covering paid-up capital, total number of shareholdings, number of shareholdings less than £1,000, between £1,000 and

£10,000 and the number and names of all shareholdings of £10,000 and over, together with the names and amounts of shareholdings less than £10,000 which appeared to be of interest for control purposes. These details, together with the names of directors and the voting power of shares for each company, are given in the Appendix, and it is this comprehensiveness of basic data which makes the work valuable for students of the limited liability company as an Australian economic institution.

An introductory discussion on the study and its setting is followed by an explanation of the basis on which the companies were selected and some notes on the source material and method used. Then follows an analysis of the data under the headings of Ownership—Voting Shares, Ownership of Non-Voting Preference Shares, Distribution of All Shares, Overseas Interests—Large Shareholdings, Control, and Director Interests. Wherever practicable, the results of the analysis are related to those of comparable studies in the U.S.A. and the U.K.

I suppose it is the duty of a reviewer to direct attention to errors which are revealed by his perusal of a book. In this case such attention is reluctantly drawn to a curious slip in the last line of Table III at page 42, where the percentage averages per company of number of shareholdings in the categories selected are shown as being different from, instead of the same as, the percentages given immediately above for all companies.

Another minor criticism might also be directed at some of the information in Table I, on pp. 25-28. Of the 102 companies listed, a consolidated figure for shareholders' funds is shown as "not available" for twenty-four of them. The author points out that this means that no such consolidated figure is given in the Sydney Stock Exchange Investment Service, which was used as the source of this information. However, in view of the fact that the relevant balance sheets themselves were available for these companies (see p. 33), it is submitted that reference to them would have allowed the number of "Not Available" companies to be reduced somewhat, especially in relation to those registered under Victorian company legislation, which provides that a holding company shall publish either consolidated financial statements or statements for the holding company and each of its subsidiaries. But it is freely admitted that the point is not a material one in relation to the purpose or scope of the enquiry and does nothing to detract from its usefulness and significance.

L. GOLDBERG

University of Melbourne.

Income and Wealth Series VI. Edited by MILTON GILBERT and RICHARD STONE. (Bowes and Bowes, London, 1957.) Pp. xiv + 306. 42/- stg.

This book contains ten papers presented at the Fourth Conference of the International Association for Research in Income and Wealth,

held at Hindsgavl (Denmark) in 1955. The first three papers relate to econometric model-building, and assess the reliability, for economic forecasting purposes, of particular models that have been developed in the United States, the Netherlands and Norway. Non-mathematicians will be grateful to C. F. Christ for the clear description of model-building procedure which precedes his comparison of the usefulness of nine theoretical models constructed in U.S.A. between 1939 and 1955. Sceptics of the model-building approach to policy-making will find some comfort in the fact that even the best of these models proved to be rather less reliable, in forecasting 1952 values, than a naive model which assumed no change from the previous year.

The other two model-building papers, which discuss models actually used by government agencies in the Netherlands and Norway, show more encouraging results. The first, by J. Lips and D. B. J. Schouten, investigates the reliability of the model used, for fiscal policy-making purposes, by the Central Planning Bureau of the Netherlands; and the second, by P. J. Bjerve, describes a model used for forecasting bank liquidity in Norway as a guide to monetary policy in that country. An interesting section of the latter paper shows how an econometric model may be constructed on the basis of a system of double-entry accounts.

The second section of the book contains seven papers on income distribution. Of these, two (by Dorothy S. Brady and R. Bentzel) are mainly concerned with theoretical problems associated with the interpretation of changes in income distribution, and the remainder (by K. Bjerke, S. A. Goldberg and Jenny R. Podoluk, H. P. Brown, Dorothy Cole and J. E. G. Utting, and O. Aukrust) analyse various aspects of income distribution in particular countries (respectively Denmark, Canada, Australia, Cambridgeshire and Norway).

Australian readers will be particularly interested in H. P. Brown's path-breaking analysis of income distribution in Australia, mainly in relation to the year 1942-43. Separate size distributions are given for that year by sex and age groups, States and grade of occupation (employees, proprietors and rentiers). Another table gives size distributions for adult male employees in four industries in 1938, and for Commonwealth public service administrative officers in 1937, and 1955. In the final and most novel section of his paper Mr. Brown develops what he calls "an inferiority index", designed to measure the inequality of income distribution by relating a given level of income to the average of incomes above that level on the one hand and the average of incomes below the given income on the other. This index, the author suggests, corresponds to an individual's conception of income inequality, and can be calculated for particular groups or for the whole community as well as for individuals. The final table in Mr. Brown's paper calculates inferiority indexes for various groups (sex, age, State, grade of occupation) in 1942-43, for employees and non-employees from 1938-39 to 1942-43, for adult male employees in four industries in 1938, and for the Commonwealth public service in 1937

and 1955. Unfortunately there are several printing errors which tend to obscure the sense of the paper, e.g. Table X on p. 219 should read Table IX; 1.51_d on p. 219 and p. 220 should read $1.5I_d$; 1001′ on p. 220 should read 100I′; and in Table VI a column of figures representing the December 1954 size distribution is omitted.

RUSSELL MATHEWS

University of Adelaide.

An Economic Theory of Democracy. By ANTHONY DOWNS. (Harpers, New York, 1957.) Pp. ix + 310. $4.50.

This important and lucidly written book attempts to work out a behaviour rule for governments, comparable to the rules economic theory uses in predicting the actions of firms and of consumers.

Downs constructs a model which posits that parties and voters behave rationally, in the economic sense of that term. Parties are postulated to be political entrepreneurs. Their motive is self-interest; to attain and keep office they will formulate whatever policies they believe will maximize support.

Downs deals with political decision-making where "perfect information" exists, then considers the effects of uncertainty, and, in one of his most suggestive sections, the relation of information costs to political behaviour. The book ends with twenty-five allegedly testable propositions, derived from the party-motivation, the citizen-rationality hypothesis, or both, e.g. "Because nearly every citizen realizes his vote is not decisive in each election, the incentive of most citizens to acquire information before voting is very small".

The model, of course, is very restricted, and Downs has to narrow down "Democracy" to "government", this again to "party". It would be interesting to hear what judges or administrators maximize. His treatment of ideologies is unconvincing.

But this is an important work; those who have no time to read it should at least look at Downs' article in the *Journal of Political Economy,* April 1957.

HENRY MAYER

University of Sydney.

Sales Taxation. By JOHN F. DUE. (Routledge & Kegan Paul, London, 1957.) Pp. 396. 40/- stg.

An up-to-date coverage of sales taxation in the non-communist world may not justify many thousand pages but it is a valiant effort to use less than 400. The virtues and deficiencies of this volume arise from the feat of compression which has been performed.

The survey of sales taxes in some twenty-seven countries has, if one may judge by the Australian section, been admirably performed. It gives a quick and clear picture of what is done in each country. The remainder of the volume is an all too brief introduction and conclusion.

Many points are raised in summary form but few are covered adequately. Of Australian interest is the emphasis on sales tax in Federal systems as the independent source of revenue for that level of government which has not pre-empted income tax.

Unfortunately sales tax has, of necessity, been so narrowly defined that many associated "business" taxes are not referred to—retail licence fees, pay-roll taxes, stamp duties and (negatively) subsidies. The absence of any reference to the U.S.S.R. where, it would appear, turnover taxes have been most fully used for a whole range of purposes also detracts from the general usefulness of the book. For example there is little, if any, reference to the role of sales taxes in guiding investment, restraining imports or checking excess profits.

But (near) pocket compendiums have their role; this is a good one and for perhaps half-a-dozen people in Australia, an essential one.

H. P. Brown

Australian National University.

An Economic Survey of Northern Ireland. By K. S. Isles and Norman Cuthbert. (H.M. Stationery Office, Belfast, 1957.) Pp. xxv + 646. 35/- stg.

The economy of Northern Ireland is comparable, as regards status, with the economy of Tasmania. That is, although isolated geographically from the rest of the United Kingdom (as Tasmania is from the rest of Australia), Northern Ireland possesses the same monetary unit, the same tariff structure and virtually the same fiscal arrangements; it allows the free migration of persons to and from the rest of the United Kingdom and the free transfer of goods and money; and its ability to initiate action in the economic field is strictly limited.

The economy of Northern Ireland is to be regarded, therefore, not as a separate entity but as a regional component of the United Kingdom economy (just as the Tasmanian economy is to be regarded as a regional component of the Australian economy); and, accordingly, an economic survey of Northern Ireland ought to concentrate on those features of the province which distinguish it, economically, from the rest of the United Kingdom.

This is the essence of the approach adopted by the authors of the above survey, which was carried out by the Economics Department of the Queen's University of Belfast at the request of the government of Northern Ireland. As they see it, the two outstanding facts which distinguish the economy of the province from that of the rest of the United Kingdom are that income per head is persistently lower and the level of unemployment persistently higher. Part I of the survey—the first three chapters—is designed to establish these two facts while Part II—chapters 4 to 17—sets out to explain them. The key chapter here is the final one for which the others (covering such topics as Export Trade, Transport, Investment, Wages and Interregional Migration) merely clear the ground. The survey is rounded off by Part III

which contains three chapters on the policy implications of Parts I and II.

Much of the statistical information which the authors required was unavailable and they were consequently obliged to set about collecting it for themselves. Details of the methods adopted in this connection are set out in a long series of appendices.

A. J. HAGGER

University of Tasmania.

Economic Backwardness and Economic Growth. By HARVEY LEIBENSTEIN. (John Wiley and Sons, New York, 1957.) Pp. ix + 295. $6.75.

Leibenstein propounds a theory to explain both the persistence of stagnation and low incomes in backward economies and how development may commence in such circumstances. The former he explains in terms of a quasi-equilibrium system brought about by the interaction of compensating variables, the latter by his concept of dynamic disequilibrium based upon his "minimum-effort" thesis. Forces which occur to raise incomes bring into operation other forces which depress incomes. For the former to overcome the latter they must be of a certain minimum strength. He expands his theory in a stimulating and illuminating way, offering interesting explanations of the low agricultural yields, the large amount of underemployment, and the occupational distribution characteristic of a backward economy. He seeks also to explain population as an endogenous variable. It would be a useful exercise to compare his approach with the vicious circle thesis of Nurkse and others and with Myrdal's strictures on the concept of equilibrium in economics. What Leibenstein has to say is also not irrelevant to the growth models of Harrod, Domar, and others. He has offered us a useful and original approach.

JAMES P. BELSHAW

University of New England.

Business Cycles and Economic Policy. By ERIK LUNDBERG. (George Allen & Unwin, London, 1957.) Pp. xx + 346. 32/- stg.

With minor changes, this book on economic stabilization policy in Sweden in the inter-war period and since 1945, is a translation of Professor Lundberg's *Konjunkturer och Ekonomisk Politik* which was first published in 1953. It analyses the ends, means and effectiveness of the detailed physical controls and import and investment regulations used in the post-war period, and compares them with the more general methods of economic policy, particularly monetary and fiscal measures, used in the inter-war period. While this involves a detailed study of Swedish economic fluctuations and general development over the whole period, the basic problems are, of course, by no means peculiarly Swedish, and therefore Lundberg's scepticism about the possibility of interpreting accurately the effects *ex ante* as well as *ex post* of detailed

economic regulation in peacetime is of wide interest and general importance.

The book is also an account of the development of economic ideas in Sweden where economists have played an active and important part in the formulation, rationalisation, and implementation of government policy. One of the author's main objects is to show the relation between the various economic measures and the relevant economic theory.

G. A. J. SIMPSON-LEE

University of Sydney.

Activity Analysis and the Theory of Economic Equilibrium. By HELEN MAKOWER. (Macmillan, London, 1957.) Pp. xiv + 192. 41/6 Aust.

This is perhaps the best introduction to activity analysis for the non-mathematician which has yet appeared. The book is intended for the economist or advanced student familiar with traditional doctrine. The author aims to reformulate the theory of value in terms of activity analysis. The reader is taken by the hand until, in Chapter 3, he is shown the vision of resource allocation as seen by activity analysts. Readers will welcome the homespun approach to such esoteric terms as the Dual and the Simplex method, as well as the absence of such terms as convex polyhedral cone.

The author intentionally avoids both the detailed mechanics of activity analysis and its field of application to practical problems. This seems rather a pity, particularly as Chapter 5 sets out very lucidly the fundamental principles involved.

BURGESS CAMERON

Canberra University College.

Labor in a Growing Economy. By MELVIN W. REDER. (John Wiley, New York, 1957.) Pp. xii + 534. $6.50.

This is not, as its title might suggest, a book about the labour problems of an underdeveloped economy. It is an undergraduate textbook on labour. The specific effects of growth are emphasized in so far as the discussion about labour problems is in the context of American history.

With this minor qualification, let it be said at once that this is an excellent textbook, comprehensive in scope and extremely lucid in style. It is in four parts. Part I is an introductory survey. Part II deals with industrial relations—unionism, collective bargaining and government regulation. Parts III and IV are concerned with labour economics —wages and their determination, employment and the labour market, income distribution and social security.

However, unlike most texts on labour, the different parts are linked together by an approach which explicitly recognizes and emphasizes the inter-relationships between institutional and economic

phenomena. Numerous cross-references facilitate this integration process without being unduly repetitive.

An outstanding feature of the book is that the sections dealing with wage theory are at a low level of abstraction. For example, the marginal productivity theory is briefly introduced and only superficially discussed. It is a credit to the author that these chapters should be comprehensible to the student without any background in economic theory. Nevertheless, it is a pity that the author, who is well qualified to indulge in the most complex abstractions, should not have included the more difficult pieces of theory in an appendix or two—a method successfully employed by Samuelson in his *Economics*.

This book is, of course, designed for the American market but the Australian student (and teacher) will find many of the sections on unions, collective bargaining and wage determination extremely useful. The discussion questions appended to the chapters should also prove helpful.

J. E. Isaac

University of Melbourne.

International Monetary Policy. By W. M. Scammell. (Macmillan, London, 1957.) Pp. xiv + 402. 60/- Aust.

More than ten years have now elapsed since the launching of the Bretton Woods twins, the I.M.F. and the I.B.R.D. This period is long enough to give an indication of their likeliness to fulfil the high hopes which attended their birth. This book is an attempt to assess the effectiveness of the post-war international payments system of which they were to be the keystones.

After a brief theoretical section dealing with the balance of payments, exchange rates and alternative systems of adjustment, the author recounts the development of plans for post-war economic co-operation from Article VII of the Lend-Lease Agreement to Bretton Woods. He then proceeds to describe the institutions that emerged from that conference and to assess the role they have played in the intervening years. The picture of post-war monetary arrangements is rounded out by a description of the sterling area, the European Payments Union and the pattern of world payments in the post-war period. The book then ends with a discussion of the dollar problem and various proposals for international co-operation in the achievement of full employment and the control of inflation.

On the whole the analysis is reasonably objective but suffers from a pronounced British bias in its assessment of the achievements of the various institutions. This is particularly apparent in its treatment of the I.M.F. which is described as having sunk into obscurity. There is insufficient recognition of the efforts the Fund has made to cope with its difficulties. For example, the use of the waiver of the "25 per cent rule" is merely mentioned in a footnote, whereas in fact most drawings since 1953 have been larger than 25 per cent of the member's quota.

More prominence might also have been given to the inauguration of the "stand-by arrangement" which is merely described as an interesting innovation. Advocacy of fluctuating exchange rates is a recurring theme throughout the book without, in the reviewer's opinion, sufficient recognition of the case against the extension of this practice. A minor criticism is that the account of the differences between the Keynes and White plans and the process of synthesizing them is far more detailed than required by the average reader. In spite of these criticisms the book can be recommended as a valuable review of post-war experience in the field of international payments.

D. G. BADGER

Sydney.

French Banking Structure and Credit Policy. By J. S. G. WILSON. (London School of Economics and Political Science, G. Bell & Sons, London, 1957.) Pp. vii + 453. 45/- stg.

The literature in English on the French banking system is scanty. We therefore have good reason to be grateful to Mr. Wilson who in his new book has attempted to provide not only a comprehensive description of French monetary and banking institutions but also a review of the conduct of French monetary and banking policy. Our thanks are also due to the Houblon-Norman Fund which assisted Mr. Wilson to complete his study.

Authors of studies of this type are confronted with a perpetual dilemma. Their ultimate aim is to analyse the operation of the system and the conduct of monetary policy. However, unless the institutional framework is described in sufficient detail the analysis which follows will either be unintelligible or strike the reader as unconvincing dogmatism weakly sustained by casual empiricism. On the other hand if the descriptive material is too detailed, either the reader may fail to see the wood for the trees and blame the author for his myopia or the analysis may be truncated.

Mr. Wilson meets this dilemma by dividing his book into two parts. Part I, the aim of which is primarily descriptive, deals with the commercial banks, the banques d'affaires and other money market institutions. It also contains an interesting account of French banking techniques. In general the author retains French banking terminology, providing explanations of the terms where necessary. Since the French banking system is complex and the terminology unfamiliar, this part of the book is not easy reading. The reader will, however, find the effort it demands worth making though it seems possible that a more careful use of chapter summaries and diagrams might have facilitated comprehension by the reader.

The second part of the book deals with the Bank of France and the conduct of monetary policy from the end of the war until 1956. This part of the book struck the reviewer as less successful principally because it is not easy, unless one is thoroughly familiar with French

economic events, to retain a clear picture of the chronology through Chapters XII and XIII. Perhaps a more generous use of graphs recording the behaviour of the main economic indicators would have helped? Indeed it is a general (though minor) criticism that some of the longer tables would have been simpler to analyse if supporting graphs had been provided.

The book contains a short but useful bibliography and a comprehensive index. There is, however, no list of tables or diagrams.

There can be no doubt that Mr. Wilson has written a careful and detailed study which will be deservedly welcomed by economists, students of comparative banking systems and bankers.

D. C. ROWAN

N.S.W. University of Technology.

Europe and the Money Muddle. By ROBERT TRIFFIN. (Yale University Press, New Haven, Conn., 1957.) Pp. 351. $5.00.

Professor Triffin has given us what is undoubtedly the best description and appraisal of the foundation and subsequent evolution and experience of the International Monetary Fund and the European Payments Union. We are fortunate to be able to benefit from the first-hand knowledge of someone who himself played a considerable part in many of the events he describes. He is to be congratulated also on the light-hearted note he brings into the introductory matter—the review of the book by himself (which may well take the wind out of any other reviewer's sails), and his rejoinder to himself, as well as the flippant yet useful guide for the cursory reader with which he interlaces the table of contents.

Many will feel that Triffin's opening survey of the world dollar problem, in which his attitude is notably more optimistic than that of MacDougall, is less successful than the rest of the book. In particular, by concentrating upon the United States' balance of payments with, and loss of gold to, the rest of the world, he is able to argue that the world dollar problem had virtually disappeared (as it seemed when he wrote in late 1956 and early 1957); whereas it may be more accurate to say that it was becoming transformed into the more general problem of a shortage of both dollars and German marks, and the concentration of the world's gold and dollar reserves upon North and Central America and Western Germany.

His second chapter, containing a useful summary of the post-war recovery of the economy of Western Europe, stands somewhat apart from the rest of the book. For in the remaining chapters he is really concerned with *world* monetary problems. Triffin argues persuasively for the relative success achieved by the regional approach of the EPU to monetary co-operation (compared with the wider but more idealistic approach of the I.M.F.), and for building upon this foundation. But the relatively greater growth of Europe's exports to the dollar area than to other countries after 1949 does not of itself constitute an

argument (as he suggests) that the liberalisation of OEEC trade did not unduly reduce Europe's exports to the rest of the world. Account must surely be taken of the effect of the devaluations of 1949, of the U.S. recovery from recession, and of the fact that Europe's exports to non-dollar markets—which also devalued—rose much less than did intra-European trade.

Finally Triffin's far-reaching and imaginative proposals for the future development of international monetary arrangements are among the most stimulating so far published. They are unlikely to lose their relevance and importance in the foreseeable future.

J. O. N. PERKINS

University of Melbourne.

Social Security in the British Commonwealth. By RONALD MENDELSOHN. (Athlone Press, London; John de Graff, New York.) Pp. xv + 391.

This book provides a comparative analysis of the social security systems of Britain, Canada, Australia and New Zealand. Its coverage is not therefore quite as wide as its title suggests and there is no reference to the Asian dominions, except for the pertinent remark that "it would be wrong to regard social security as a luxury exclusively for the industrially advanced countries". The book also bears evidence of its origin as a London doctoral thesis in being somewhat orientated towards British problems, but this is an advantage rather than otherwise since during the present century Britain has, to quite a unique extent, been the political furnace in which social security devices have been tried and tempered before travelling round the world. This is true even of devices which originated outside of Britain, such as old age pensions which were introduced in some of the Australasian colonies before 1900; or the concept of a fully integrated social security system which New Zealand introduced in 1938; or social insurance itself which had its origin in continental Europe.

In the first half of the book the author gives a detailed account of the development and organization (*circa* 1950) of social security in each of the four countries. In the second half of the book the various systems are compared with respect to such matters as coverage of both persons and contingencies; adequacy and conditions of benefit; methods of finance; and administrative systems, including the place of voluntary organizations. This method inevitably lends itself to repetition and reiteration, and some space could perhaps have been saved if the author had consigned more of his text to the tabular appendix. Nevertheless, the book is much more than a dry catalogue of financial provisions and administrative arrangements. The author writes well. He has obviously reflected deeply on the lessons of the past and has interesting suggestions to make for the future.

It might be expected that the four countries examined would have roughly comparable social security systems in view of their common

legal and cultural heritage and their relatively high living standards. In fact, however, there are quite extraordinary differences among them. Britain and New Zealand have fully integrated social security systems embracing pensions, short-term benefits and health facilities. But both are countries with unitary constitutions. Federalism, although its significance is questioned by Dr. Mendelsohn, seems to preclude complete integration in either Australia (where hospitals, workers' compensation and residual relief remain with the states), or in Canada (where not only these functions, but sickness and medical assistance also remain with provincial or local authorities). On the other hand, Canada alone of the dominions has followed Britain in relying substantially on the insurance principle, having adopted it for unemployment insurance, "with little critical thought about fundamentals just about the time when its originator, Great Britain, was abandoning its more rigid features" (p. 230). In New Zealand social security is financed, in the absence of insurance contributions, largely by a special income tax levied on a proportional basis. In Australia finance is now provided exclusively by allocations from general taxation revenue. In both Australia and New Zealand the means test takes the place of an applicant's contribution record as a test of eligibility for benefit; apparently there is not the same fierce hostility to the means test in the dominions as in Britain, with its bitter memories of the old Poor Law. Canada, and more particularly, Quebec seems in the past to have relied more than other countries on voluntary charitable agencies, but Australia is the only country that now uses the voluntary Friendly Society as a channel for the payment of medical and hospital benefits.

In spite of these diversities, there is one common element which Dr. Mendelsohn detects in the development of these widely different systems during the past half century. It is "the substitution of defined benefits, dependent only on citizenship, for the arbitrariness of the Poor Law officer or the handouts of the colonial policeman" (p. 335). In Britain social insurance performed the valuable historical function of making this change politically acceptable, but Dr. Mendelsohn considers that the distinction between insurance and assistance has lost its point now that membership has become universal and compulsory. It is also administratively costly, and his description of its operation is worth quoting:

> National insurance has become a giant industry. The long queues in post offices buying stamps to place on cards; the 25 million separate cards, stamped weekly and exchanged annually in quarterly "staggers"; the 25 million separate ledger record sheets at Newcastle, with spaces for 50 years' entries; the shuttle cards passing from the 997 Ministry of National Insurance local offices and the 1424 Ministry of Labour and National Service local offices and back, 100,000 of them each week in summer and 250,000 in winter; the 29 million central index slips; the annual personal statements of account and arrears notices to each of the 25 million contributors; the 64 acres of buildings at Newcastle-on-Tyne, with their own railway station and their special fleets of buses . . . (p. 232).

On the basis of his comparative study of the four countries, Dr. Mendelsohn is able to offer suggestions for the future development of

their social security systems. He would welcome, and considers inevitable, an extension of social services to cover all contingencies and all citizens in countries where this has not already happened, e.g. Canada. He would like to see the abolition of both the stamped-card system, characteristic of social insurance, and of the Means Test, characteristic of the Australian and New Zealand systems; so that any citizen would be entitled to benefit on simple proof that he was the victim of a defined contingency. Further, he would like to see benefits raised nearer to the subsistence level than is at present the case in Britain, but not so high as in New Zealand. He recognizes that in spite of administrative savings these changes would involve an increase in social security expenditure but he observes that, considered as a proportion of National Income, this amounted in 1948-49 to little more than 4 per cent in Canada, and 5 per cent in Britain and Australia, as compared with 9½ per cent in New Zealand. For finance he would replace insurance contributions from both employees and employers by a special personal income tax collected with ordinary income tax, but paid into a special fund. He would like to see the adoption in the Dominions of the British system of appeals against the decisions of administrators, and also greater participation by local bodies in administration. Finally, he would like to see more use made of social case-work methods in the handling of supplementary and residual relief in all countries.

WILFRED PREST

University of Melbourne.

INTERNATIONAL LABOUR REVIEW

Monthly. Articles on economic and social topics. A statistical supplement gives information on employment, unemployment, wages, consumer prices, etc. Among recent articles have been the following:

"Social Credit Societies": A French Experiment in Africa.
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BOOKS RECEIVED*

A.—AUSTRALIAN AND NEW ZEALAND PUBLICATIONS

COOMBS, H. C. *Conditions of Monetary Policy in Australia.* (R. C. Mills Memorial Lecture, University of Sydney, 1958.) Pp. 40. 5/- Aust.

This analysis of Australian central banking experience by the Governor of the Commonwealth Bank is a continuation of his discussion of the subject in the period up to 1954, which was contained in his E.S. & A. Research Lecture of that year.

This latest lecture covers principally the years 1954 to 1957. In it Dr. Coombs discusses such matters as the development of central banking control through L.G.S. ratios (coupled with use of Special Accounts), qualitative advances control and the problems presented by the growth of non-bank finance, especially hire purchase finance.

GOLDBERG, L., and HILL, V. R. *The Elements of Accounting.* 2nd ed., revised and re-set. (Melbourne University Press, Carlton, Victoria, 1958.) Pp. 300. 25/- Aust.

LAMBERTON, D. McL. *Share Price Indices in Australia.* (Law Book Co. of Australasia, Sydney, 1958.) Pp. 114. 42/- Aust.

LAWTON, G. H. (ed.). *Longmans' Australian Geographies.* (Longmans Green & Co., Melbourne, from 1956.)

A series of booklets, each of 40 pages. 1. *The Snowy Mountains Scheme,* by Robert Coggins. 2. *The Hunter Valley,* by Alan Tweedie. 3. *The Barkly Tableland,* by Mollie Bayne. 4. *The New England Plateau,* by Ellis Thorpe. 5. *Indonesia,* by Donald Fryer. 6. *The Darling Downs,* by R. Greenwood. 7. *New Guinea,* by John Andrews. 8. *The South-West,* by J. Gentilli. Probably 5/3 Aust. each.

MATHEWS, R., and GRANT, J. McB. *Inflation and Company Finance.* (Law Book Co. of Australasia, Sydney, 1958.) Pp. 179. 42/- Aust.

B.—OTHER PUBLICATIONS

ALLARDYCE, CORBIN (ed.). *Atomic Power. An Appraisal including Atomic Power in Economic Development.* (International Series of Monographs on the Economic Aspects of Nuclear Energy.) (Pergamon Press, London, 1957.) Pp. 151. 21/- stg.

This is another "pre-fusion" book, based on the state of research and development of over two years ago. However, most economists and laymen can congratulate themselves if they are no more than two years behind Sir John Cockcroft, Sir Edwin Plowden, Admiral Strauss, and other contributors. The editor, who is Adviser in Atomic Energy to the World Bank, introduces the subject with a lucid and fascinating assessment of progress made and prospects opened up. His collaborators extend the basis of scientific, engineering, and economic assumptions for the final analysis. The book is most valuable as an approach to the investment problems involved today in the development of energy sources in parts of Australia and elsewhere.

BASU, S. K. *A Survey of Contemporary Banking Trends.* (The Book Exchange, Calcutta, 1957.) Pp. 574. Rs. 16.

BEACH, E. F. *Economic Models—An Exposition.* (John Wiley & Sons, New York, 1957.) Pp. 227. $7.50.

BERLE, A. A. Jr. *Tides of Crisis. A Primer of Foreign Relations.* (Macmillan, London, 1957.) Pp. 328. 34/9 Aust.

BIEHL, M. *Der Obst-, Gemüse- und Gartenbau im Nordosten der Vereinigten Staaten von Amerika unter der Konkurrenz subtropischer Landesteile.* (Institut für Weltwirtschaft an der Universität Kiel, Kiel, 1958.) Pp. 173, 25 Schaubilder. Mit Anhang: 77 Tabellen, 6 Blätter u. 3 Schaubilder, D.M. 30.

BLEEKER, R. J. P. VAN GLINSTRA. *Guided Money.* (North-Holland Publishing Co., Amsterdam, 1956.) Pp. 173. 30/-.

Dr. Van Glinstra Bleeker complains that fiscal or monetary policies designed to affect the level of aggregate demand are inappropriate to meet situations in which demand is lacking for only one or more products. He presents

* Acknowledgment of publications does not guarantee review.

the thesis that structural maladjustments in the economy would be alleviated if consumer expenditure were to be "homed" on to specific products, by the creation of a flow of "guided" money to be used only for the purchase of those products. Part I of the book is concerned with the justification of such a policy (though no rigorous theoretical analysis of its implications is attempted); Parts II and III discuss its possible domestic and international applications.

BRECHER, IRVING. *Monetary and Fiscal Thought and Policy in Canada, 1919-39.* (University of Toronto Press, 1957.) Pp. 337. $5.25.

The author discusses the views of the various conservative and radical groups in Canada on such questions as inflation, central banking, exchange depreciation, and budget deficits; the balancing and co-ordinating, rather than innovating, role of the economists; the general question of the inter-relation of economic thought and policy; and the development of a new climate of opinion about economic stability by 1939. Despite the writing and construction, which are both rather clumsy, the book is thorough, and should be of particular interest to Australians, who could well do with a similar study of the same period.

CASE, H. C. M., and WILLIAMS, D. B. *Fifty Years of Farm Management.* (University of Illinois Press, Urbana, 1957.) Pp. 386. $6.00.

CHOW, G. C. *Demand for Automobiles in the United States.* (North-Holland Publishing Company, Amsterdam, 1957.) Pp. 110. 10 guilders.

The author tests a number of hypotheses purporting to explain the demand for motor-cars in the United States. The best explanation of changes in the volume of motor-car sales over the period 1921-1953 is given by a function relating sales to an index of the real price of motor-cars of all ages, real disposable income and the stock of motor-cars at the end of the preceding year.

DUE, J. F. *Sales Taxation.* (Routledge & Kegan Paul, London, 1957.) Pp. 396. 40/- stg.

F.A.O. *Program for the 1960 World Census of Agriculture.* (Food and Agriculture Organization of the United Nations, Rome, 1957.) Pp. 77. Price not stated.

FURNISS, E. S. *The Position of the Laborer in a System of Nationalism. A Study in the Labor Theories of the Later English Mercantilists.* (Kelley & Millman, New York, 1957.) Pp. 260. $6.00.

Furniss's brilliant essay on English attitudes towards labour in the seventeenth and eighteenth centuries is an important reference for students of the history of economic thought. Not all of its arguments would be accepted without qualification today, but on the whole it has weathered the years very well. Messrs. Kelley and Millman have done well to include the book in their series of reprints of economic classics.

Only one reservation need be noted. When originally published Furniss's work contained a number of bibliographical errors. It would not have been possible to correct these in a photographic reprint, such as the present one, but the publishers could perhaps have appended their own list of errata. From the point of view especially of undergraduate readers, this would have been a very useful service.

FEDERAL RESERVE SYSTEM. *Consumer Instalment Credit.* Parts I-III. (U.S. Government Printing Office, Washington, 1957.) Price not stated.

GHOSH, ALAK. *Indian Economy. Its Nature and Problems.* (The World Press Private Ltd., Calcutta, 1957.) Pp. 368. Rs. 8.50.

An analysis "primarily oriented towards growth problems" which is divided into eight parts. They deal with the economics of underdevelopment and the nature of the Indian economy in the pre-planning period, planning and the Indian economy, natural resources and national income, population and agriculture, industry and labour, public finance, banking and currency, and trade, exchange and transport.

HUME, DAVID. *Writings on Economics.* Edited and introduced by Eugene Rotwein. (Thomas Nelson & Sons, Edinburgh, 1955.) Pp. 224. 49/9 Aust.

This will be the definitive edition of David Hume's economic writings. In addition to the famous essays Dr. Rotwein usefully reproduces extracts from Hume's correspondence discussing economic topics. The long, intelligent and learned introduction makes a new estimate of Hume's distinctive contribution to the history of economic thought. This is a beautifully printed and altogether satisfying volume, an example of what Hume would have classified as "innocent luxury".

INMAN, P. *Labour in the Munitions Industries.* (*History of the Second World War.*) (H.M. Stationery Office, London, 1957.) Pp. 461. 35/- stg.

INTERNATIONAL ASSOCIATION FOR RESEARCH IN INCOME AND WEALTH. *Income and Wealth. Series VI.* (Bowes and Bowes, London, 1957.) Pp. 306. 42/- stg.

ISLES, K. S., and CUTHBERT, N. *An Economic Survey of Northern Ireland.* (H.M. Stationery Office, Belfast, 1957.) Pp. 646. 35/- stg.

JOHNSON, CHARLES (ed.). *The De Moneta of Nicholas Oresme and English Mint Documents.* (Thomas Nelson & Sons, Edinburgh, 1956.) Pp. 114. 33/3 Aust.

This volume of *Nelson's Medieval Texts* (ed.: Professors V. H. Galbraith and R. A. B. Mynors) presents the treatise of the 14th-century Frenchman Oresme on the theory of money, and entries relating to coinage extracted from 13th and 14th century Exchequer MSS. Each part consists of 48 double pages: on the left page the Latin text, on the right page Charles Johnson's exact translation. The introduction of the volume gives biographical data about Oresme, describes the manuscripts, and sketches the early history of English coinage.

KUCHHAL, S. C. *Corporation Finance. Principles and Problems.* (Chaitanya Publishing House, Allahabad, 1957.) Pp. 519. Rs. 11/8.

This book might be called a cyclopaedia of finance. Although it is primarily concerned with the Indian scene, which has many interesting characteristics such as the managing agency system, substantial references are also made to distinctive features of the financial systems of the more developed economies of Europe, America and the Pacific.

LEIBENSTEIN, HARVEY. *Economic Backwardness and Economic Growth.* (John Wiley & Sons, New York, 1957.) Pp. 295. $6.75.

MAKOWER, HELEN. *Activity Analysis and the Theory of Economic Equilibrium.* (Macmillan, London, 1957.) Pp. 192. 41/6 Aust.

MATHUR, A. S. and J. S. *Trade Union Movement in India.* (Chaitanya Publishing House, Allahabad, 1957.) Pp. 303. Rs. 10.

An interesting study of the weak Indian trade union movement. Compulsory arbitration is widespread and is criticised. This should interest New Zealand readers. The political division of the four main union federations is explained and suggestions are made for strengthening trade unions in India by removing some of their organizational weaknesses.

NAIDU, B. V. NARAYANASWAMI, and DATTA, H. K. *Fundamentals of Business Organisation and Management.* 4th ed. (M. Seshachalam & Co., Madras, 1957.) Pp. 620. Rs. 12.

NANIWADA, HABUO. *Staat und Wirtschaft. Grundlegung der Nationalökonomie als der Logik der Bürgerlichen Gesellschaft.* (The Science Council of Japan, Tokyo, 1957.) Pp. 76. Price not stated.

OXENFELDT, A. R. *Economic Systems in Action.* Revised ed. (Rinehart & Co., New York, 1957.) Pp. 207. $2.35.

PHELPS, C. W. *Accounts Receivable Financing as a Method of Business Finance.* (Commercial Credit Company, Baltimore, 1957.) Pp. 65. Price not stated.

This is a descriptive study of a form of financial assistance provided by commercial credit corporations in the United States. Originating early in this century, these companies now finance open accounts of business firms to the extent of 5 billion dollars annually. The service is used by small and medium sized businesses principally but not exclusively. Charges are based on daily balances, the institutions thus providing something similar to overdraft facilities in Australia. The cost to users is of the order of 10 per cent per annum. These institutions also provide accommodation on other bases, so that users have, from one source, a range of methods of maintaining and supplementing working capital. This is one of a series sponsored by the publisher, from which educational institutions may obtain copies on application.

POPPER, KARL R. *The Poverty of Historicism.* (Routledge & Kegan Paul, London, 1957.) Pp. 166. 16/- stg.

This revised reprint from *Economica* 1944/45 should be compulsory reading for model-builders and planners of progress. It is indispensable for the urgent task of separating causal structures that can be *known*, from more ambitious, prophetic constructs that can only be sung to the tune "Onward Christian Soldiers". In its historical role as philosophy for the rising middle classes Economics has inherited too many such hymns.

SCAMMELL, W. M. *International Monetary Policy.* (Macmillan, London, 1957.) Pp. 402. 60/- Aust.

SEN, S. R. *The Economics of Sir James Steuart.* (The London School of Economics and Political Science, G. Bell & Sons, London, 1957.) Pp. 207. 25/- net stg.

Dr. Sen gives a summary and appraisal, supported by extensive quotation, of Steuart's leading ideas on economic theory and policy. There is also a short biography, a discussion of Steuart's methodology, and a chapter on his role as adviser to the East India Company on currency problems in Bengal. Some may feel that Dr. Sen is, if anything, a little over-generous in his assessment of Steuart's place in the history of economic thought, but this is essentially a balanced, fair-minded and very useful book.

SHENOY, B. R. *The Indian Economic Scene—Some Aspects.* (Presidential Address to the Fortieth Annual Conference of the Indian Economic Association, 1957.) Pp. 50. Price not stated.

SINGH, D. BRIGHT. *Inflationary Price Trends in India since 1939.* (Asia Publishing House, Bombay, 1957.) Pp. 284. Rs. 16.50.

This theoretical and empirical survey first sets out the war-time and post-war trends, with an account of the distortions caused by war financing and the subsequent national and international policies. After a discussion of the effects of rising prices on the costs of living, there is an appraisal of the Indian price controls and the pricing policy that has emerged.

SPULBER, NICHOLAS. *The Economics of Communist Eastern Europe.* (Massachusetts Institute of Technology, John Wiley & Sons, New York, 1957.) Pp. 525. $12.50.

In recent years there has poured forth from the M.I.T. a veritable deluge of books all of which we are told will provide us with a penetrating analysis of one or other branch of the Social Sciences. Particularly ambitious have been those dealing with the changes taking place in the international scene. Professor Spulber's book is one of this series. Its purpose is to undertake an examination of the economic development of Eastern European countries since 1945. While not helping us to understand very much more about the origins of the tremendous forces unleashed in Poland and Hungary in the autumn of 1956 it does provide us with a valuable source of economic data. A professional book for professionals.

TOSTLEBE, A. S. *Capital in Agriculture. Its Formation and Financing since 1870.* (Princeton University Press, 1957.) Pp. 232. $6.00.

This is an attempt to measure the long-term growth of the physical and financial assets used in farming in the U.S.A., to relate this growth of capital to the growth of the farm labour force and to output, and to discover the determinants of investment and the sources of financing that made them possible.

UNITED NATIONS. *New Sources of Energy and Economic Development.* (U.N. Department of Economic and Social Affairs, New York, 1957.) Pp. 150. 9/- stg.

Part I reviews the stage of development, location, and main uses of power from solar, wind, tidal and geothermic sources and the thermal differences in sea water. Part II consists of extracts from expert technical reports on the method of utilizing each source. Part III is an annotated 30 page bibliography, mainly of technical works in the field. Utilization of these new sources of energy could be very valuable for underdeveloped countries lacking conventional energy resources and where small amounts of power are required over large areas for such purposes as irrigation, drainage, food preservation and communications.

WILSON, CHARLES. *Profit and Power. A Study of England and the Dutch Wars.* (Longmans, Green & Co., London, 1957.) Pp. 169. 43/6 Aust.

A very useful factual survey of the course of events and the connection between commercial rivalry and war. The description of the economic aspects of England and Holland is well done but the conclusion that hostilities ended because religion was more important than commercial quarrels is unconvincing. Reasoning is sometimes obscured by loose terminology; for example, "Dutch technical superiority in economic matters" where "commercial" should be substituted for "economic". In naval history there is a similar looseness in the author's use of, and excessive fondness for, "strategic", while "strategic" and "economic" matters are treated as being distinct, even antithetical, like Profit and Power of the title.

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